Air Quality Permitting
Technical Memorandum

January 22, 2003

Tier II Operating Permit and Permit to Construct
No. 077-00023
Chevron Pipeline Company, Pocatello, Idaho

Project No. T2-010301

Prepared by:

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State Office of Technical Services

FINAL PERMIT

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AP-42	Compilation of Air Pollutant Emissions Factors, Volume J: Stationary Point and Area Sources
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	United States Environmental Protection Agency
gal/yr	gallons per year
HAP	Hazardous Air Pollutant
IDAPA	Idaho Administrative Procedures Act
L	liter
m^3	cubic meter
MACT	Maximum Available Control Technology
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
PSD	Prevention of Significant Deterioration
PTC	permit to construct
SIP	State Implementation Plan
SO_2	sulfur dioxide
T/yr	tons per year
µm	micrometers
VDU	Vapor Destruction Unit
VOC	volatile organic compound

PURPOSE

The purpose of this memorandum is to explain the legal and factual basis for this draft Tier II operating permit in accordance with IDAPA 58.01.01.400 and the inclusion of existing Permits to Construct in accordance with IDAPA 58.01.01.200, *Rules for the Control of Air Pollution in Idaho*.

DEQ staff has reviewed the information provided by the Chevron Pipeline Company regarding the operation of their facility located in Pocatello, Idaho. The permittee requested status as a synthetic minor source. The basis for qualifying as a synthetic minor source is the limitation of gasoline, diesel, and transmix throughput to the petroleum storage tanks and loading racks.

The permittee also requested to increase the permitted throughput of gasoline, diesel, and transmix products to the facility. The permit authorizes the facility to increase throughput of gasoline, diesel, and transmix by adding a drag reducing agent to the incoming pipeline to increase the product flow rate.

PROJECT DESCRIPTION

This project is for a renewed Tier II operating permit that creates state and federally enforceable limitations on the Pocatello facility's potential to emit VOCs. This permit qualifies the Chevron Pocatello facility as a "synthetic minor" for both VOC and HAP emissions. The permit limits VOC and HAP emissions from the storage tanks and loading racks to below the major facility threshold listed below:

- VOC emissions - 100 T/yr, and
- HAPs emissions - 10 T/yr for a single HAP and 25 T/yr for aggregated HAPs.

As a "synthetic minor" source, the Chevron Pocatello facility is not subject to Tier I permitting, pollutant registration, and registration fee payments for major facilities.

FACILITY DESCRIPTION

The Chevron Pipeline Company/Northwest Terminalling Company facility located in Pocatello, Idaho, began operation in 1963. Initially the entire facility belonged to Chevron, but in 1994, with the exception of the mainline and manifold, it was transferred to Northwest Terminalling Company. Chevron personnel continue to operate the entire facility.

The facility receives refined petroleum products via a single 8-inch pipeline. This pipeline is part of a pipeline system that originates in Salt Lake City, Utah. When product comes in to the facility, it is routed to one of the aboveground storage tanks. From the storage tanks, the product is transferred to tanker trucks. During the transfer, additives are added to the product. Additives are brought to the facility by truck and loaded into one of the onsite additive tanks.

The facility, as originally constructed, consisted of 17 aboveground petroleum storage tanks, two additive storage tanks, a truck loading facility, and associated piping. Since 1963, seven aboveground petroleum storage tanks and 11 aboveground additive tanks have been added to the original facility. In 1997, a vapor destruction unit was added to the truck loading operation.

SUMMARY OF EVENTS

- On February 28, 1994, DEQ issued Chevron a PTC for the addition of the diesel storage tanks No. 919 and No. 920.
- On June 6, 1994, DEQ issued another PTC to Chevron for the addition of the diesel storage tanks No. 919 and No. 920 because of a typo in the permit number.

- On April 21, 1995, DEQ issued a PTC to Chevron for the addition of the diesel storage tanks No. 919 and No. 920 to enforce 40 CFR 60, Subpart Kb.
- On June 12, 1995, DEQ received an application from Chevron for a Tier I operating permit.
- On November 23, 1998, DEQ received an updated version of the June 12, 1995 Tier I application.
- On April 2, 2001, DEQ received an application from Chevron for a Tier II operating permit.
- On August 15, 2001, DEQ received an notice of proposed throughput increase from Chevron.
- On December 5, 2001, DEQ received an addendum to the August 15, 2001 request for an increase in product throughput.
- On May 31, 2002, the Tier II application was declared complete.
- On August 16, 2002, DEQ issued a draft Tier II/PTC for facility review.
- On September 6, 2002, DEQ received comments from the Chevron Pipeline Company.
- A public comment period was held between October 31, 2002 and November 29, 2002. Comments were received by DEQ. The DEQ's response to the comments is presented in Appendix A.

DISCUSSION

1. <u>Emission Estimates</u>

The Chevron Pocatello facility includes the emission sources described below.

Loading Losses/Vapor Destruction Unit: Loading losses are the primary source of evaporative emissions from the loading rack operations. The losses occur as organic vapors in empty cargo tanks are displaced to the atmosphere by the liquid being loaded into the tanks. The loading racks are bottom-loading with a vapor containment and destruction system. Recovered vapors are sent to the VDU.

Emissions from the vapor collection system are controlled by a John Zink vapor destruction unit described as a "vertical cylindrical combustion chamber with refractory insulation and steel inner-lining." The starting sequence begins with a pre-purge in which the air blower purges the combustion chamber for several minutes to remove any residual hydrocarbons. The pilot light then comes on and vapors are fed to the burner through a detonation arrestor by a vapor blower.

The VDU does not appear to meet the definition of a thermal oxidizer since the combustion chamber does not have a specified retention time. This emissions control device meets the definition of a flame.

John Zink, the manufacturer of the VDU, guarantees that the VOC emissions from the unit will not exceed 10 mg VOC/L gasoline loaded (0.000083 lb VOC/gal gasoline). The manufacturer also guarantees that CO emissions will not exceed 10 mg CO/L, and NO_x emissions will not exceed 4 mg NO_x/L. According to the Gasoline Distribution MACT 2001 Annual Pocatello Report (January 28, 2001), the performance test for the VDU demonstrated VOC emissions less than 10 mg VOC/L gasoline confirming the manufactures specifications.

The vapor destruction unit will operate while diesel and transmix is loaded. However, the emissions from these two fuel types is nearly zero when uncontrolled; therefore, Chevron calculated VDU emissions of VOC from the diesel and transmix loading racks using AP-42 equations. A summary of emissions from the VDU is presented in Table 1.

Table 1. Emissions Estimates – Vapor Destruction Unit

PRODUCT	PERMITTED THROUGHPUT (gal/yr)	VOC EMISSIONS (T/yr)	CO EMISSIONS (T/yr)	NO_x EMISSIONS (T/yr)
Gasoline	370,800,990	15.5	15.5	6.2
Transmix	2,520,000	0.039	0.11	0.042
Diesel	191,453,010	1.3	8.0	3.2
Facility Totals	Not Applicable	**16.8**	**23.6**	**9.4**

Fixed Roof Storage Tanks: There are 23 fixed roof storage tanks that contain refined petroleum products, fuel additives, and/or contaminated water (transmix). The working capacity of these tanks ranges in size from 24 barrels to 19,344 barrels (one barrel equals 42 gallons). Eight of the tanks are vertical and contain diesel fuel, transmix, or gasoline additive. The remaining smaller tanks are horizontal and contain various fuel additives or transmix. Emissions of VOC from fixed roof storage tanks vary as a function of vapor pressure of the stored liquid, tank utilization rate, tank capacity and dimensions, tank color, and atmospheric conditions at the tank location. The VOC emissions from the fixed roof tanks result from liquid evaporation during storage and from changes in the liquid level. Evaporation losses occurring during filling and emptying operations are known as working losses. Losses occurring during standing storage are known as breathing losses. Emissions from the fixed roof storage tanks were calculated using EPA AP-42 equations. The results of Chevron's analysis using AP-42 equations are presented in Appendix B. These calculations were reviewed by DEQ staff and found consistent with DEQ methods.

Floating Roof Storage Tanks: There are 14 floating roof storage tanks that contain refined petroleum products. The working capacity of these tanks ranges in size from 7,380 barrels to 20,000 barrels. All the tanks are vertical and contain either gasoline or diesel fuel. Emissions of VOC from fixed roof storage tanks vary as a function of vapor pressure of the stored liquid, tank utilization rate, tank capacity and dimensions, tank color, and atmospheric conditions and average wind speed at the tank location. Emissions from the floating roof tanks were calculated using EPA AP-42 equations. The results of Chevron's analysis using AP-42 equations are presented in Appendix B. These calculations were reviewed by DEQ staff and found consistent with DEQ methods.

Fugitive Emissions Sources: Fugitive emissions sources at marketing terminals and Pipeline facilities are generally defined as VOC emissions sources not associated with a specific process, but scattered throughout the facility. These sources include storage tanks, valves of all types, flanges, and pump and compressor seals. The EPA has provided interim average emissions factors to estimate most fugitive VOC emissions from various pieces of equipment at marketing terminals. Average emissions factors do not require individual screening values for each component. All that is needed is the number of components in each source category. The number of components in each category is multiplied by the appropriate average emissions factor. The resulting mass for each category can then be added to determine the total fugitive emissions from the facility. The results of Chevron's analysis using EPA fugitive emissions factors are presented in Appendix B. These calculations were reviewed by DEQ staff and found consistent with DEQ methods.

Facility-wide Emissions Summary: Based on the analysis using AP-42 equations, the standing and working VOC emissions from the fixed roof tanks are 0.95 T/yr. The standing and working VOC emissions from floating roof tanks are 23.7 T/yr. These emissions were calculated at the permitted throughput rates. Emissions from fugitive sources are estimated at 0.89 T/yr, and emissions from maintenance activities are also estimated at 0.89 T/yr.. When summed with the loading losses, VOC emissions estimates submitted by Chevron for the loading racks and storage tanks summed up to 42.3 T/yr. As these emissions are well below the 100 T/yr threshold for major sources, the permitted emissions of the loading racks and storage tanks were multiplied by 120% to account for cyclic fluctuations in the system. The permitted VOC emissions equals 51.8 T/yr. The permitted emissions limits for each source are located in Appendix A of the permit.

HAP Emissions: The aggregate HAP emissions estimates submitted by Chevron for the loading racks and storage tanks summed up to be 1.45 T/yr. The aggregated HAP emissions are 17.2 times smaller than the 25 T/yr aggregate HAP major source threshold. The largest single HAP emission is toluene at 0.51 T/yr. The toluene emissions are 19.6 times smaller than the 10 T/yr single HAP major source threshold. The results of Chevron's HAP emissions analysis are presented in Appendix C. These calculations were reviewed by DEQ staff and found consistent with DEQ methods. Table 2 details the HAPs emissions inventory for the Chevron Pocatello facility.

Table 2 - HAPS EMISSIONS INVENTORY

POTENTIAL HAP	HAPS EMISSIONS (T/YR)*
Acetaldehyde	8.3E-06
Acrolein	3.1E-06
Formaldehyde	9.7E-06
Benzene	1.4E-01
Biphenyl	1.0E-04
Cresols/Cresylic Acid	3.1E-04
Cumene	5.8E-03
Ethyl Benzene	2.0E-02
Hexane	3.0E-01
Methyl tert butyl ether	2.4E-01
Naphthalene	1.5E-03
Phenol	5.7E-04
Styrene	9.5E-04
Toluene	5.1E-01
Xylenes	2.3E-01
TOTAL	**1.45**

* Emissions rates before maintenance factors were applied (Chevron's addendum to the Tier II application received December 11, 2001).

The HAPs listed in Table 1 are defined as VOCs. Therefore, HAP emissions are inherently limited by VOC emissions. Both VOC and HAP emissions are subsequently limited by the facility throughput limitations. The VOC and HAP emissions estimates submitted in the Tier II operating permit application would be exceeded only if Chevron violated the permittee throughput limits.

2. Throughput

The permitted throughput for each fuel product is located in Appendix A of the permit. These are the throughputs and fuel product types requested by Chevron, which allows them to be designated a minor source.

3. 40 CFR 60, Subpart XX

Since the VDU is not a modification or a reconstruction of the loading racks, Chevron is not subject to the provisions of this subpart.

4. 40 CFR 60, Subpart Kb

Tank No. 920 is subject to the provisions of this subpart because it:

- was constructed after July 23, 1984,
- has a capacity greater than 40 m^3,
- stores a liquid with vapor pressures greater than 5.2 kPa but less than 76.6 kPa, and
- the facility has a gasoline throughput greater than 75,700 L/day.

Tank No. 919 is not subject to this subpart because it stores a liquid that has a vapor pressure less than 3.5 kPa.

Per a telephone message received May 1, 2002, Jim Robbins noted that tank No. 917 had the bottom replaced approximately three years ago. According to the definition of modification, a repair or replacement shall not be considered a physical change. Therefore, Tank No. 917 is not subject to this subpart.

5. 40 CFR 63, Subpart R

On September 9, 2000, the EPA determined that 40 CFR 63, Subpart R applied to Chevron's tank farm in Pocatello, Idaho. According to the memorandum from John S. Seitz, Director of the Office of Air Quality Planning and Standards, "Potential to Emit for MACT Standards – Guidance on Timing Issues", once a MACT standard applies to a facility, the facility must always comply with the MACT standard.

6. Previous Permits To Construct

As discussed in the summary of events, three PTCs were previously issued to the facility. The subjects of all three PTCs were Tanks 919 and 920. Each subsequent PTC superseded the previous PTC; therefore, only the most recent PTC (issued on April 21, 1995) was incorporated into this Tier II/PTC.

Permit Condition 2 of the PTC issued on April 21, 1995 established limits on VOC emissions from the two tanks, and Permit Condition 3.1 established limits product throughput of the tanks. The PTC established VOC emissions on an hourly basis and an annual basis for these two tanks. This Tier II/PTC limits VOC emissions and product throughput on a facility-wide basis; therefore, Permit Conditions 2 and 3.1 of the April 21, 1995 PTC were not incorporated into this permit.

Permit Conditions 3.2, 4.2, 4.3, 5.2, and 5.3 of the PTC issued on April 21, 1995 incorporated the New Source Performance Standards of 40 CFR Part 60, Subpart Kb. The requirements of Subpart Kb are included in the proposed Tier II/PTC permit; therefore, Permit Conditions 3.2, 4.2, 4.3, 5.2, and 5.3 of the PTC issued on April 21, 1995 were not included in the proposed Tier II/PTC permit.

7. Modeling

Modeling was not required for this project.

8. Area Classification

The Chevron Pocatello facility is located in Power County, Idaho, AQCR 61, Zone 12. Power County is classified as a moderate nonattainment area for PM_{10}. The area is designated as unclassifiable for all other criteria air pollutants (i.e., CO, NO_x, SO_x, and VOCs).

9. Facility Classification

The facility is not a designated facility as defined by IDAPA 16.01.01.006.25 of the *Rules*. The facility is classified as an SM source due to permitted VOC emissions limits below 100 T/yr, and permitted HAP emissions below 10 T/yr single HAP and 25 T/yr aggregated HAP major source thresholds.

10. Regulatory Review

This operating permit is subject to the following permitting requirements:

a.	IDAPA 58.01.01.006 & 7	Definitions
b.	IDAPA 58.01.01.130-136	Excess Emissions
c.	IDAPA 58.01.01.401	Tier II Operating Permit
d.	IDAPA 58.01.01.403	Permit Requirements for Tier II Sources
e.	IDAPA 58.01.01.404.01	Opportunity for Public Comment
f.	IDAPA 58.01.01.404.01(c)(v)	Consideration of Comments and Final Action
g.	IDAPA 58.01.01.404.04	Authority to Revise or Renew Operating Permits
h.	IDAPA.58.01.01.405	Conditions for Tier II Operating permits
i.	IDAPA 58.01.01.406	Obligation to Comply
j.	IDAPA 58.01.01.470	Permit Application Fees for Tier II Permits
k.	IDAPA 58.01.01.625	Visible Emissions
l.	IDAPA 58.01.01.650-651	General Rules for the Control of Fugitive Dust
m.	IDAPA 58.01.01.728	Sulfur Content Limit for Distillate Fuel Oil
n.	Section 37-2506,Idaho Code	Quality Standards for Motor Gasoline and Distillate Fuel Oil-Specifications Set By American Society of Testing and Materials
o.	40 CFR 60, Subpart Kb	Standards of Performance for VOC Storage Vessels
p.	40 CFR 60, Subpart XX	Standards of Performance for Bulk Gasoline Terminals
q.	40 CFR 63, Subpart R	Emission Standards for Gasoline Facilities

AIRS

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	B						U
NO_x	B						U
CO	B						U
PM_{10}	B						N
PT (Particulate)	B						U
VOC	SM		SM			SM	U
THAP (Total HAPs)	B				B	B	-
			APPLICABLE SUBPART				
			Kb		R		

AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant, which is below the 10 (T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

This permit is for a synthetic minor permit, therefore, the facility is exempt from paying the Tier II processing fee in accordance with IDAPA 58.01.01.407.02.d. The facility is current with the Registration and Registration Fees in accordance with IDAPA 58.01.01.525.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a final Tier II operating permit and Permit to Construct to the Chevron Pipeline Company in Pocatello, Idaho. An opportunity for public comment on the air quality aspects of the proposed operating permit have been provided in accordance with IDAPA 58.01.01.404.01.c.

MJS/MS:sm G:\Air Quality\Stationary Source\Ss Ltd\T2\Nw Terminalling Pocatello\Final Prep\T2-9506-099-1 Tech Memo.Doc

cc: Tiffany Floyd, Pocatello Regional Office

APPENDIX A

Response To Public Comments

January 22, 2003

STATE OF IDAHO
DEPARTMENT OF ENVIRONMENTAL QUALITY
RESPONSE TO PUBLIC COMMENTS
ON DRAFT AIR QUALITY TIER II OPERATING PERMIT/PERMIT TO CONSTRUCT
FOR CHEVRON PIPELINE CO. AND NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
LOCATED IN POCATELLO, IDAHO

Introduction

As required by IDAPA 58.01.01.404 (*Rules for the Control of Air Pollution in Idaho*), the Department of Environmental Quality (Department) provided for public comment the Chevron Pipeline Co. and Northwest Terminalling Company draft Tier II operating permit/Permit to Construct. Public comment packages, which included the application materials, draft permit, and technical memorandum, were made available for public review at the Marshall Public Library in Pocatello, the Departments Pocatello Regional Office, and the Departments State Office in Boise. The public comment period was held from October 31, 2002 to November 29, 2002. Comments regarding the air quality aspects of the draft permit are provided below with the Departments response immediately following. A final permit that incorporates the public comments has been crafted and will be issued by the Department.

Public Comments and Department Responses

Comment 1: We would prefer having the CFR regulations referenced rather than copied verbatim into the permit. The permit is rather voluminous, and therefore, not very user friendly.

The Department included the CFR regulations verbatim at the request of Department inspectors. Department inspectors prefer to have the applicable portions of CFR regulations within the permit to assist with facility inspections by alleviating uncertainty in the field as to what portion of CFR regulations apply to an emissions unit.

Comment 2: "Regulated Sources" Section, permit page 5 – At the Pocatello facility, there is not a DRA tank as noted in the table. Delete this item from the table.

The reference to the DRA tank has been removed from the table on page 5 of the permit.

Comment 3: Permit Condition 2.13 – The reference to "ASTM Grade 4, 5, and 6 residual fuel" was not included in previous (August 16, 2001) versions of the draft permit. Additionally, these grades fuel are not located at the facility.

Permit Condition 2.13 is within the facility-wide permit conditions. These conditions are standard conditions included in every permit. The Department's omission of the residual oil sulfur content standard in the permit was an oversight that was corrected in the proposed permit. In accordance with Permit Condition 2.14, the permittee is required to monitor sulfur content of any shipment of distillate oil or residual oil received at the facility. If the facility does not receive residual oil, no monitoring or recordkeeping is necessary.

Comment 4: There were several comments regarding calculating VOC emissions on a monthly and 12-month rolling basis (Permit Conditions 3.3, 3.7, 4.2, and 4.6).

The Department has removed the requirement for calculating VOC emissions on a monthly basis. The Tier II/PTC is being issued to limit the facility's potential to emit (PTE) to below major source thresholds. To calculate emissions, the permittee used the *Tanks* program and specified throughput rates. Therefore, if the permittee monitors throughput rates, and the throughput rates are below the rates modeled in Tanks, then the permittee is reasonably assured of complying with the annual VOC emissions limits. The permittee is required to monitor throughput rates, but is not required to calculate emissions on a 12-month rolling basis.

Comment 5: **There were several comments regarding calculating product throughput rates on a monthly and 12-month rolling basis (Permit Conditions 3.4, 3.6, 4.3, 4.5.1). The permittee requests the throughput rates be calculated once per calendar year.**

As discussed in the response to Comment 4, the permittee is required to monitor product throughput rates to reasonably assure compliance with the annual VOC emissions limits in the permit.

Attachment A is an Environmental Protection Agency (EPA) documentation regarding appropriate time frames for limiting PTE. Please note Sections I - IV of the guidance, as these discussions specifically address time frames. EPA recommends production or operational limits intended to reduce potential to emit be as short-term as possible and should generally not exceed one month. In cases where it is not reasonable to hold a source to a one-month limit, "...a limit spanning a longer time is appropriate if it is a rolling limit."

In developing the permit, the Department limited the PTE of VOC emissions from the storage tanks to below major facility thresholds. The emission limit is an annual standard. In accordance with EPA guidance, the emission limit, operational limit, and associated monitoring requirements must be based on a rolling 12-month time frame in order to be enforceable.

Comment 6: **Permit Condition 3.5 – It is unclear of the intent of "procedures shall be logged". Currently the facility has an operating procedure for truck drivers who load at the facility. We believe that this fulfills the intent of this condition.**

The Department agrees that the operating procedure fulfills the intent of the permit condition. The permit condition was reworded to state, *"Operating procedures for the loading rack shall be maintained at the facility and be made available to Department representatives upon request."*

Comment 7: **Appendix B, page 37 & Facility-wide Emissions Summary – Change 50.8 tons per year to 51.8 tons per year.**

Maintenance activities contributing 1 ton per year of VOC emissions were not accounted for in the emission inventory. The Department added these emissions to the inventory. The additional emissions will not cause annual VOC emissions from the facility to exceed the major source threshold.

The following comments were submitted and address typographical errors within the permit or errors in process descriptions. The suggested corrections to the errors were made within the permit and/or technical memorandum.

- **Permit Condition 2.14 – Change reference "specified on Permit Condition 2.14" to "specified on Permit Condition 2.13".**
- **Permit Condition 3.1 – Change "The loading racks are bottom loading racks" to "The loading rack is a bottom loading rack with a vapor...".**
- **Permit Condition 3.2 – Change "...they are combined with natural gas and..." to "...where they are destroyed...". The combustor does not use natural gas to assist the destruction process.**
- **Permit Condition 3.3 – Change "...loading racks..." to "...loading rack...".**

END OF COMMENTS

ATTACHMENT A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

JUN 13 1989

MEMORANDUM

SUBJECT: Guidance on Limiting Potential to Emit in New Source Permitting

FROM: Terrell E. Hunt
Associate Enforcement Counsel
Air Enforcement Division
Office of Enforcement and Compliance Monitoring

John S. Seitz, Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Addressees

This memorandum transmits the final guidance on conditions in construction permits which can legally limit a source's potential to emit to minor or de minimis levels. We received many helpful comments on the January 24, 1989 draft of this guidance, and have incorporated the comments into the final document wherever possible. A summary of the major changes which have been made to the guidance in response to these comments is provided below.

Several commenters noted that the draft guidance used the term "federally enforceable" to mean both federally enforceable as defined in the new source regulations (40 C.F.R. Sections 52.21(b) (17), 51.165(a) (1) (xiv), 51.166(b) (17)), and enforceable as a practical matter. We have tried to distinguish the places where each term should be used, explained the relationship between the two terms, and indicated that in order to properly restrict potential to emit, limitations must be both federally enforceable as defined in the regulations and practically enforceable.

Some commenters requested that the section on averaging times for production limits be more specific as to when it is appropriate to use limitations which exceed a one month time basis. We have tried to explain why it is not possible to develop generic criteria for making this distinction, and to indicate situations where exceptions to the policy that production and operation limitations not exceed one month may be warranted.

There were some requests for a section on enforcement. We have included a new Section VI which addresses this topic. We also received many good suggestions on the example permit limitations. The section on examples has been substantially reworked to reflect your comments.

Finally, we learned through the comments that in two specific circumstances, short term emission limits are the most useful and reasonable way to restrict and verify limits on potential to emit. These circumstances are: 1) when control equipment is installed but control equipment operating parameters are difficult to measure during enforcement inspections; and 2) in surface coating operations with numerous and unpredictable use of coatings containing varying VOC content, where add-on control equipment is not employed. Therefore, we have made a narrow exception to the flat prohibition on use of emission limits to restrict potential to emit for these specific circumstances, and only when certain additional conditions have been met.

Again, we appreciate the thoughtful comments we have received on this guidance. Please insert this document into your Clean Air Act Compliance/Enforcement Policy Compendium as Item Number H.3. If you have any questions, please contact Judith Katz in the Air Enforcement Division at FTS 382-2843, or Sally Farrell in the Stationary Source Compliance Division at FTS 382-2875.

Addressees:

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DOJ

LIMITING POTENTIAL TO EMIT IN NEW SOURCE PERMITTING

JUNE 13, 1989

AIR ENFORCEMENT DIVISION
OFFICE OF ENFORCEMENT AND COMPLIANCE MONITORING

STATIONARY SOURCE COMPLIANCE DIVISION
OFFICE OF AIR QUALITY PLANNING AND STANDARDS

Limiting Potential to Emit in New Source Permitting

I. Introduction

II. The Louisiana-Pacific Case

III. Types of Limitations that will Limit Potential to Emit

IV. Time Periods for Limiting Production and Operation

V. Sham Operational Limits

   A. Permits with conditions that do not reflect a source's planned mode of operation are void ab initio and cannot act to shield the source from the requirement to undergo preconstruction review.

      1. Sham permits are not allowed by 40 CFR 52.21(r) (4)

      2. Sham permits are not allowed by the definition of potential to emit: 40 CFR 52.21(b) (4), 51.165(a) (1) (iii), 51.166(b) (4)

      3. Sham permits are not allowed by the Clean Air Act

   B. Guidelines for determining when minor source construction permits are shams.

      1. Filing a PSD or nonattainment NSR application

      2. Applications for funding

      3. Reports on consumer demand and projected productions levels

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VI. Enforcement Procedures

VII. Examples

VIII. Conclusion

Limiting Potential to Emit in New Source Permitting

I. Introduction

Whether a new source or modification is major and subject to new source review under Parts C and D of the Clean Air Act is dependent on whether that source or modification has or will have the potential to emit major or significant amounts of a regulated pollutant. Therefore, the definition of "potential to emit" under the new source regulations is extremely important in determining the applicability of new source review to a particular source. The federal regulations define "potential to emit" as:

> the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of fuel combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

40 C.F.R Sections 52.21(b) (4), 51.165(a) (1) (iii), 51.166(b) (4).

Permit limitations are very significant in determining whether a source is subject to major new source review. This is because they are the easiest and most common way for a source to obtain restrictions on its potential to emit. A permit does not have to be a major source permit to legally restrict potential emissions. A minor source construction permit issued pursuant to a state program approved by EPA as meeting the requirements of 40 C.F.R. Section 51.160 is federally enforceable. In fact, any permit limitation can legally restrict potential to emit if it meets two criteria: 1) it is federally enforceable as defined by 40 C.F.R. Sections 52.21(b) (17), 51.165(a) (1) (xiv), 51.166(b) (17), i.e., contained in a permit issued pursuant to an EPA-approved permitting program or a permit directly issued by EPA, or has been submitted to EPA as a revision to a State Implementation Plan and approved as such by EPA; and 2) it is enforceable as a practical matter. The second criterion is an implied requirement of the first criterion. A permit requirement may purport to be federally enforceable, but, in reality cannot be federally enforceable if it cannot be enforced as a practical matter.

Non-permit limitations can also legally restrict potential to emit. These limitations include New Source Performance Standards codified at 40 C.F.R. Part 60 and National Emission Standards for Hazardous Air Pollutants codified at 40 C.F.R. Part 61.

The appropriate means of restricting potential to emit through permit conditions has been an issue in recent enforcement cases. Through these cases and through guidance issued by EPA, the Agency has addressed three questions: what types of permit limitations can legally limit potential to emit; whether long averaging times for production limitations are enforceable as a practical matter; and whether sources may limit potential to emit to minor source levels as a means of circumventing the preconstruction review requirements of major source review.

II. The Louisiana-Pacific Case

In United States v. Louisiana-Pacific Corporation, 682 F. Supp. 1122 (D. Colo. Oct. 30, 1987) and 682 F. Supp. 1141 (D. Colo. March 22, 1988), Judge Alfred Arraj discussed the type of permit restrictions which can be used to limit a source's potential to emit. The Judge concluded that:

> ... not all federally enforceable restrictions are properly considered in the calculation of a source's potential to emit. While restrictions on hours of operation and on the amount of materials combusted or produced are properly included, blanket restrictions on actual emissions are not.

682 F. Supp. at 1133.

The Court held that Louisiana-Pacific's permit conditions which limited carbon monoxide emissions to 78 tons per year and volatile organic compounds to 101.5 tons per year should not be considered in determining "potential to emit" because these blanket emission limits did not reflect the type of permit conditions which restricted operations or production such as limits on hours of operation, fuel consumption, or final product.

The Louisiana-Pacific court was guided in its reasoning by the D.C. Circuit's holding in Alabama Power v. Costle, 636 F. 2d 323 (D.C. Circuit 1979). Before Alabama Power, EPA regulations required potential to emit to be calculated according to a source's maximum uncontrolled emissions. In Alabama Power, the D. C. Circuit remanded those regulations to EPA with instructions that the Agency include the effect of in-place control equipment in defining potential to emit. EPA went beyond the minimum dictates of the D.C. Circuit in promulgating revised regulations in 1980 to include, in addition to control equipment, any federally enforceable physical or operational limitation. The Louisiana-Pacific court found that blanket limits on emissions did not fit within the concept of proper restrictions on potential to emit as set forth by Alabama Power.

Moreover, Judge Arraj found that:

> ...a fundamental distinction can be drawn between the federally enforceable limitations which are expressly included in the definition of potential to emit and (emission) limitations.... Restrictions on hours of operation or on the amount of material which may be combusted or produced ... are, relatively speaking, much easier to "federally enforce." Compliance with such conditions could be easily verified through the testimony of officers, all manner of internal correspondence and accounting, purchasing and production records. In contrast, compliance with blanket restrictions on actual emissions would be virtually impossible to verify or enforce.

Id. Thus, Judge Arraj found that blanket emission limits were not enforceable as a practical matter.

Finally, the Court reasoned that allowing blanket emission limitation to restrict potential to emit would violate the intent of Congress in establishing the Prevention of Significant Deterioration (PSD) program.

III. Types of Limitations that will Restrict Potential to Emit

As an initial matter in this discussion, a few important terms should be defined. Emission limits are restrictions over a given period of time on the amount of a pollutant which may be emitted from a source into the outside air. Production limits are restrictions on the amount of final product which can be manufactured or otherwise produced at a source. Operational limits are all other restrictions on the manner in which a source is run, including hours of operation, amount of raw material consumed, fuel combusted, or conditions which specify that the source must install and maintain add-on controls that operate at a specified emission rate or efficiency. All production and operational limits except for hours of operation are limits on a source's capacity utilization. Potential emissions are defined as the product of a source's emission rate at maximum operating capacity, capacity utilization, and hours of operation.

To appropriately limit potential to emit consistent with the opinion in Louisiana-Pacific, all permits issued pursuant to 40 C.F.R. Sections 51.160, 51.166, 52.21 and 51.165 must contain a production or operational limitation in addition to the emission limitation in cases where the emission limitation does not reflect the maximum emissions of the source operating at full design capacity without pollution control equipment. Restrictions on production or operation that will limit potential to emit include limitations on quantities of raw materials consumed, fuel combusted, hours of operation, or conditions which specify that the source must install and maintain controls that reduce emissions to a specified emission rate or to a specified efficiency level. Production and operational limits must be stated as conditions that can be enforced independently of one another. For example, restrictions on fuel which relates to both type and amount of fuel combusted should state each as an independent condition in the permit. This is necessary for purposes of practical enforcement so that, if one of the conditions is found to be difficult to monitor for any reason, the other may still be enforced.

When permits contain production or operational limits, they should also have recordkeeping requirements that allow a permitting agency to verify a source's compliance with its limits. For example, permits with limits on hours of operation or amount of final product should require an operating log to be kept in which the hours of operation and the amount of final product produced are recorded. These logs should be available for inspection should staff of a permitting agency wish to check a source's compliance with the terms of its permit.

When permits require add-on controls operated at a specified efficiency level, permit writers should include, so that the operating efficiency condition is enforceable as a practical matter, those operating parameters and assumptions which the permitting agency depended upon to determine that the control equipment would have a given efficiency.

An emission limitation alone would limit potential to emit only when it reflects the absolute maximum that the source could emit without controls or other operational restrictions. When a permit contains no limits on capacity utilization or hours of operation, the potential to emit calculation should assume operation at maximum design or achievable capacity (whichever is higher) and continuous operation (8760 hours per year).

The particular circumstances of some individual sources make it difficult to state operating parameters for control equipment limits in a manner that is easily enforceable as a practical matter. Therefore, there are two exceptions to the absolute prohibition on using blanket emission limits to restrict potential to emit. If the permitting agency determines that setting operating parameters for control equipment is infeasible in a particular situation, a federally enforceable permit containing short term emission limits (e.g. lbs per hour) would be sufficient to limit potential to emit, provided that such limits reflect the operation of the control equipment, and the permit includes requirements to install, maintain, and operate a continuous emission monitoring (CEM) system and to retain CEM data, and specifies that CEM data may be used to determine compliance with the emission limit.

Likewise, for volatile organic compound (VOC) surface coating operations where no add-on control is employed but emissions are restricted through limiting VOC contents and quantities of coatings used, emission limits may be used to restrict potential to emit under the following limited circumstances. If the permitting agency determines for a particular surface coating operation that operating and production parameters (e.g. gallons of coating, quantities produced) are not readily limited due to the wide variety of coatings and products and due to the unpredictable nature of the operation, emission limits coupled with a requirement to calculate daily emissions may be used to restrict potential to emit. The source must be required to keep the records necessary for this calculation, including daily quantities and the VOC content of each coating used. Emission limits may be used in this limited circumstance to restrict potential to emit since, in this case, emission limits are more easily enforceable than operating or production limits.

IV. Time Periods For Limiting Production and Operation

As discussed above, a limitation specifically recognized by the regulations as reducing potential to emit is a limitation on production or operation. However, for these limitations to be enforceable as a practical matter, the time over which they extend should be as short term as possible and should generally not exceed one month. This policy was explained in a March 13, 1987 memorandum from John Seitz to Bruce Miller, Region IV. The requirement for a monthly limit prevents the enforcing agency from having to wait for long periods of time to establish a continuing violation before initiating an enforcement action.

EPA recognizes that in some rare situations, it is not reasonable to hold a source to a one month limit. In these cases, a limit spanning a longer time is appropriate if it is a rolling limit. However, the limit should not exceed an annual limit rolled on a monthly basis. EPA cannot now set out all inclusive categories of sources where a production limit longer than a month will be acceptable because every situation that may arise in the future cannot now be anticipated. However, permits where longer rolling limits are used to restrict production should be issued only to sources with substantial and unpredictable annual variation in production, such as emergency boilers. Rolling limits could be used as well for sources which shut down or curtail operation during part of a year on a regular seasonal cycle, but the permitting authority should first explore the possibility of imposing a month-by-month limit. For example, if a pulp drier is periodically shut down from December to April, the permit could contain a zero hours of operation limit for each of those months, and then the appropriate hourly operation limit for each of the remaining months. Under no circumstances would a production or operation limit expressed on a calendar year annual basis be considered capable of legally restricting potential to emit.

V. Sham Operational Limits

In the past year, several sources have obtained purportedly federally enforceable permits with operating restrictions limiting their potential to emit to minor or de minimis levels for the purpose of allowing them to commence construction prior to receipt of a major source permit. In such cases where EPA can demonstrate an intent to operate the source at major source levels, EPA considers the minor source construction permit void <u>ab initio</u> and will take appropriate enforcement action to prevent the source from constructing or operating without a major source permit.

The following example illustrates the kind of situation addressed in this section: An existing major stationary source proposes to add a 12.5 megawatt electric utility steam generating unit, and applies for a federally enforceable minor source permit which restricts operation at the unit to 240 hours per year. Because the project is designed as a baseload facility, EPA does not believe that the source intends to operate the facility for only 240 hours a year. Further investigation would probably uncover documentation of the source's intent to operate at higher levels than those for which it is permitted.

This situation raises the question of whether a source can lawfully bypass the preconstruction or premodification review requirements of Prevention of Significant Deterioration (PSD) and nonattainment New Source Review by committing to permit conditions which restrict production to a level at which the source does not intend to operate for any extensive time. If, after constructing and commencing operation, the source obtains a relaxation of its original permit conditions prior to exceeding them, does this constitute a violation of the preconstruction review requirements? This section discusses why it is improper to construct a source with a minor source permit when there is intent to operate as a major source, and provides guidelines for identifying these "sham" permits.

A. Permits with conditions that do not reflect a source's planned mode of operation are void ab initio and cannot act to shield the source from the requirement to undergo preconstruction review.

1. Sham permits are not allowed by 40 CFR Section 52.21(r) (4) Section 52.21(r) (4) states:

> At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980 on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then (PSD) shall apply to the source or modification as though construction had not yet commenced on the source or modification.

When a source that is minor because of operating restrictions in a construction permit later applies for a relaxation of that construction permit which would make the source major, Section 52.21(r) (4) prescribes the methodology for determining best available control technology (BACT). However, it does not foreclose EPA's ability, in addition to the retroactive application of BACT and other requirements of the PSD program, to pursue enforcement where the Agency believes that the initial minor source permit was a sham. EPA will limit its activity to requiring application of 40 CFR 52.21(r) (4) only for the cases where a source legitimately changes a project after finding that the operating restrictions which were taken in good faith cannot be complied with. Whether a source has acted in good faith is a factual question which is answered by available evidence in the particular case.

2. Sham permits are not allowed by the definition of potential to emit:

40 C.F.R. Sections 52.21(b) (4), 51.165(a) (1) (iii), 51.166(b) (4).

The definition of potential to emit enables sources to obtain federally enforceable permits with operational restrictions as a means of limiting emissions to minor source levels. However, implicit in the application of these limitations is the understanding that they comport with the true design and intended operation of the project.

3. Sham permits are not allowed by the Clean Air Act

Parts C and D of the Clean Air Act exhibit Congress's clear intent that new major sources of air pollution be subject to preconstruction review. The purposes for these programs cannot be served without this essential element. Therefore, attempts to expedite construction by securing minor source status through the receipt of operational restrictions from which the source intends to free itself shortly after operation are to be treated as circumvention of the preconstruction review requirements.

B. Guidelines for determining when minor source construction permits are shams.

EPA's determination that a purportedly federally enforceable construction permit is a sham is made based on an evaluation of specific facts and evidence in each individual case. The following are criteria which should be scrutinized when making such a determination:

1. Filing a PSD or nonattainment NSR permit application

If a major source or major modification permit application is filed simultaneously with or at approximately the same time as the minor source construction permit, this is strong evidence of an intent to circumvent the requirements of preconstruction review. Even a major source application filed after the minor source application, but either before operation has commenced or after less than a year of operation should be looked at closely.

2. Applications for funding

Applications for commercial loans or, for public utilities, bond issues, should be scrutinized to see if the source has guaranteed a c ertain level of operation which is higher than that in its construction permit. If the project would not be funded or if it would not be economically viable if operated on an extended basis

In such cases, the entire source must still go through new source review, during which, for PSD review, all pollutants for which there is a net significant increase must be analyzed for BACT. In nonattainment new source review, new sources must have LAER determinations only for pollutants for which they are major. Major modifications, however, must have LAER determinations for all nonattainment pollutants emitted in significant amounts. If the valid limits in a partially void minor source construction permit keep certain pollutants below significance levels, then those pollutants would not have to be analyzed for BACT or LAER. However, if a source or modification is determined to be major for PSD or NSR because part of its minor permit is deemed void, it would have to undergo BACT or LAER analysis for all significant pollutants.

VI. Enforcement Procedures

This guidance has discussed permit conditions which will legally restrict potential to emit, shielding a source from the requirement to comply with major new source permitting regulation. Failure by a permitting agency to adhere to these guidelines may result in a permit that does not legally restrict potential to emit, thereby subjecting a source to major new source review. If that source has not gone through preconstruction review, it is a significant violator of the Clean Air Act and is subject to enforcement for constructing or (at least a year) at the permitted level of production, this should be considered as evidence of circumvention.

3. Reports on consumer demand and projected production levels.

Stockholder reports, reports to the Securities and Exchange Commission, utility board reports, or business permit applications should be reviewed for projected operation or production levels. Ifreported levels are necessary to meet projected consumer demand but are higher than permitted levels, this is additional evidence of circumvention.

4. Statements of authorized representatives of the source regarding plans for operation.

Statements by representatives of the source to EPA or to state or local permitting agencies about the source's plans for operation can be evidence to show intent to circumvent preconstruction review requirements.

Note that if a determination is made that a permit is a "sham" for one pollutant and, therefore, the source is a major source or major modification, the permit may possibly still contain valid limits on potential to emit for other pollutants.

modifying without a major new source permit.

The enforcement options available to EPA in these situations include administrative action under Sections 167 or 113 (a) (5) of the Act or federal judicial action under Sections 113 (b) (2), 113 (b) (5), 113(c), or 167. Which enforcement option is selected depends on the facts of the particular situation. (See July 15, 1988 guidance on EPA Procedures for Addressing Deficient New Source Permits.)

VII. Examples

The following examples are provided to illustrate the type of permit restrictions which would and would not legally limit potential to emit to less than major source thresholds. These examples are provided for purposes of clarifying the potential to emit and averaging time guidance only. They are not intended to reflect all the permit conditions necessary for a valid permit. Specific test methods, compliance monitoring and recordkeeping and reporting requirements are necessary to make permit limitations enforceable as a practical matter. The use of examples where averaging times are the longest times allowed under EPA policies is not intended to necessarily condone the selection of the longest averaging times; averaging times should in practice be as short as possible.

1. The minor source construction permit for a boiler contains the following restrictions: 250,000 gal fuel/month; 0.8% S fuel; 8000 hours/year.

These conditions are federally enforceable production and operation limits, but do not limit potential to emit because one of them does not meet EPA policies on enforceability as a practical matter. The averaging time for hours of operation, one of the operational limits necessary to restrict emissions to less than 250 tpy, exceeds a monthly or rolling yearly limit. If, instead of 8000 hours/year, the hourly restriction were stated as 666 hours/month, the permit would serve to keep the source a minor source, assuming the permit contains appropriate recordkeeping provisions.

2. A waferboard plant which has the physical capacity to emit over 300 tpy of carbon monoxide in the absence of using specific combustion techniques has the following permit restriction as the sole emission limitation: 249 tpy.

This does not limit potential to emit since an operational or production restriction is necessary for the source to be restricted to 249 tpy. The permit must contain a restriction on hours of operation or capacity utilization which, when multiplied by the maximum emission rate for the CO sources at the plant, results in emissions of 249 tpy. Additionally, while the emission limit alone cannot restrict potential to emit, the emission limit is unenforceable as a practical matter since it is limited on an annual basis. The permit should contain a short term emission limit (in addition to the annual emission limit), consistent with the compliance period or parameter in the applicable test method for determining compliance.

3. A small scale rock crushing plant that cannot emit more than 240 tpy under maximum operation without controls (including plant-wide particulate emissions from transfer and storage operations) has the following permit restriction as the sole emission limitation: 240 tpy particulate matter.

Since no operational limitations are necessary for the source to emit below 250 tpy, no operational restrictions need be in the permit to limit potential to emit. However, although this is not a major source, the state agency should express the emission limit in this permit as a lb/hour measure or gr/dscf so that it will be enforceable as a practical matter.

4. A plant consisting solely of a small rock crusher has the following permit restrictions: 0.05 lb gr PM/dscf; fabric filter must be employed and maintained at 99% efficiency.

Assuming that maintaining the fabric filter at 99% efficiency will result in emissions of less than 250 tpy, this permit would limit potential to emit if it also contained either 1) parameters that allowed the permitting agency to verify the fabric filter's operating efficiency or 2) a requirement to install and operate continuous opacity monitors (COMs) and a specification that COM data may be used to verify compliance with emission limits. Note that if this second alternative were adopted, it would not be necessary to require that the fabric filter be maintained at 99% efficiency.

To determine potential to emit, the efficiency rate of the fabric filter would be multiplied by the maximum uncontrolled emission rate, the maximum number of operating hours and maximum throughput capacity since there are no other operating or production limits. However, the efficiency rate of the fabric filter would not be enforceable as a practical matter unless there were an enforceable means to monitor ESP performance on a short term basis. The two alternatives mentioned above would satisfy this requirement.

5. A surface coating operation has the capability of utilizing 15,000 gal coating/month, with the following permit restrictions: 3.0 lb VOC/gal coating minus water; 20.5 tons VOC/month; monthly VOC emissions to be determined from records of the daily volumes of coatings used times the manufacturers specified VOC content.

This does not limit potential to emit since the source has the physical capacity to exceed 250 tpy of VOC, and the permit does not contain a production or an operational limitation. A monthly limit on gallons of coating used which when multiplied by 3.0 lb/gal equates to less than the 250 tpy threshold 13,500 gallons/month), with appropriate recordkeeping, would generally be necessary to limit potential to emit. If, however, the permitting agency determines, due to the wide variety of coatings employed and products produced, that restrictions on operation or production are not practically enforceable, then the above emission limits could restrict potential to emit if there are requirements that the source calculate emissions daily, and keep the appropriate records.

If the source was alternatively to meet the 20.5 ton/month limit by employing add-on controls, the permit would need to contain an operational limit, such as the requirement to install and operate an incinerator at 99% efficiency. A requirement to monitor incinerator efficiency (either directly or indirectly via temperature monitoring for example), and appropriate recordkeeping retirements to verify compliance with each of the permit conditions would also be necessary to make the permit conditions enforceable as a practical matter. Note, however, that in the case where add-on controls are employed, the source may be able to meet a shorter term emission limit than the ton per month figure.

VIII. Conclusion

We hope this guidance will help EPA Regions identify sources which have the potential to emit major amounts of an air pollutant which will subject those sources to the requirements of preconstruction new source review. Every source which is subject to these requirements but has not obtained a major new source permit should be seriously considered for enforcement action.

APPENDIX B

Volatile Organic Compound Emissions Estimates

NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
POTENTIAL FIXED ROOF TANK VOC EMISSIONS
UPDATED October 16, 2001

Tank	Tank characteristics: AST or UST	Tank characteristics: Horizontal or Vertical	Tank Color (Aluminum, beige, gray, red, or white)	Paint Shade (Diffuse, light, N/A, medium, primer, or specular)	Paint Condition (good or poor)	Roof Type (Cone, dome, flat, or N/A)	Tank volume (bbls)	Contents	A	alpha	B	C	D	DE	deltaPB	deltaPV	deltaTV	HL	HR	HRO	HS
901	AST	Vertical	White	N/A	Good	Cone	9,215	LS Diesel #1	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
	AST	Vertical	White	N/A	Good	Cone	9,215	LS Diesel #2	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
903	AST	Vertical	White	N/A	Good	Cone	9,220	LS Diesel #1	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
	AST	Vertical	White	N/A	Good	Cone	9,220	HS Diesel #2	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
905	AST	Vertical	White	N/A	Good	Cone	9,244	HS Diesel #2	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
906	AST	Vertical	White	N/A	Good	Cone	9,237	LS Diesel #1	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
	AST	Vertical	White	N/A	Good	Cone	9,237	LS Diesel #2	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
908	AST	Vertical	White	N/A	Good	Cone	9,094	HS Diesel #2	2.642	0.17	358.22	99.9	42.5	N/A	0.06	0.0022	25.9	20.0	1.33	0.44	40.0
917	AST	Vertical	White	N/A	Good	Cone	19,344	LS Diesel #2	2.642	0.17	358.22	99.9	60.0	N/A	0.06	0.0022	25.9	20.0	1.88	0.63	40.0
930	AST	Vertical	White	N/A	Good	Cone	1,500	Transmix	0.000	0.17	0.00	0.0	21.3	N/A	0.06	0.0000	25.9	12.0	0.67	0.22	24.0
S-5300	AST	Horizontal	Aluminum	specular	Good	N/A	126	Transmix	0.000	0.39	0.00	0.0	8.0	12.2	0.06	0.0000	35.3	N/A	N/A	N/A	N/A
1-3000	UST	Horizontal	White	N/A	Good	N/A	71	Transmix	0.000	0.17	0.00	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1-5000	UST	Horizontal	White	N/A	Good	N/A	119	Transmix	0.000	0.17	0.00	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Tank	HVO	KE	KN	KP	KS	L	MV	N	PBP	PBV	PVA	PVN	PVX	Q	RS	SR	TB	TLA	TLN	TLX	VLX	VV	WV
901	20.4	0.05	1.00	1.0	1.00	N/A	130.0	11.9	0.03	-0.03	0.0044	0.0034	0.0056	109,331	21.3	0.0625	506.4	508.4	501.9	514.9	51,742	29,001	0.0001
0	20.4	0.05	1.00	1.0	1.00	N/A	130.0	31.3	0.03	-0.03	0.0044	0.0034	0.0056	289,905	21.3	0.0625	506.4	508.4	501.9	514.9	51,742	29,001	0.0001
903	20.4	0.05	1.00	1.0	1.00	N/A	130.0	11.9	0.03	-0.03	0.0044	0.0034	0.0056	109,572	21.3	0.0625	506.4	508.4	501.9	514.9	51,770	29,001	0.0001
0	20.4	0.05	1.00	1.0	1.00	N/A	130.0	23.8	0.03	-0.03	0.0044	0.0034	0.0056	219,171	21.3	0.0625	506.4	508.4	501.9	514.9	51,770	29,001	0.0001
905	20.4	0.05	0.81	1.0	1.00	N/A	130.0	46.9	0.03	-0.03	0.0044	0.0034	0.0056	433,859	21.3	0.0625	506.4	508.4	501.9	514.9	51,905	29,001	0.0001
906	20.4	0.05	1.00	1.0	1.00	N/A	130.0	11.8	0.03	-0.03	0.0044	0.0034	0.0056	109,387	21.3	0.0625	506.4	508.4	501.9	514.9	51,866	29,001	0.0001
0	20.4	0.05	1.00	1.0	1.00	N/A	130.0	31.3	0.03	-0.03	0.0044	0.0034	0.0056	289,046	21.3	0.0625	506.4	508.4	501.9	514.9	51,866	29,001	0.0001
908	20.4	0.05	0.79	1.0	1.00	N/A	130.0	47.9	0.03	-0.03	0.0044	0.0034	0.0056	435,343	21.3	0.0625	506.4	508.4	501.9	514.9	51,063	29,001	0.0001
917	20.6	0.05	0.84	1.0	1.00	N/A	130.0	63.8	0.03	-0.03	0.0044	0.0034	0.0056	1,233,529	30.0	0.0625	506.4	508.4	501.9	514.9	108,616	58,318	0.0001
930	12.2	0.05	1.00	1.0	0.99	N/A	66.0	20.0	0.03	-0.03	0.0193	0.0193	0.0193	30,000	10.7	0.0625	506.4	508.4	501.9	514.9	8,422	4,355	0.0002
S-5300	4.0	0.06	0.54	1.0	1.00	14.5	66.0	79.4	0.03	-0.03	0.0193	0.0193	0.0193	10,000	N/A	N/A	507.7	511.8	503.0	520.6	707	484	0.0002
1-3000	N/A	N/A	0.38	1.0	N/A	N/A	66.0	140.8	N/A	N/A	0.0193	N/A	N/A	10,000	N/A	N/A	506.4	508.4	N/A	N/A	399	N/A	N/A
1-5000	N/A	N/A	0.52	1.0	N/A	N/A	66.0	84.0	N/A	N/A	0.0193	N/A	N/A	10,000	N/A	N/A	506.4	508.4	N/A	N/A	666	N/A	N/A

A = Constant in vapor pressure equation
alpha = Tank paint solar absorptance
B = Constant in the vapor pressure equation
C = Constant in the vapor pressure equation
D = Tank diameter (ft)
DE = Effective tank diameter (ft)
deltaPB = Breather vent pressure range
deltaPV = Daily vapor pressure range
deltaTV = Daily vapor temp. range, (R)
HL = Liquid height (ft)
HR = Tank roof height (ft)
HRO = Roof outage (ft)
HS = Tank shell height (ft)
HVO = Vapor space outage (ft)
KE = Vapor space expansion factor
KN = Turnover factor
KP = Working loss product factor
KS = Vented vapor saturation factor
L = Length of tank (ft)
LS = Standing storage losses
LT = Total losses
LW = Working losses
MV = Vapor molecular weight
N = Number of turnovers
PBP = Breather vent pressure setting
PBV = Breather vent vacuum setting
PVA = Vapor pressure at average liquid temperature
PVN = Vapor pressure at min. surface temperature
PVX = Vapor pressure at max. surface temperature
Q = Annual throughput (bbl/yr)
RS = Tank shell radius (ft)
SR = Tank cone roof slope
TB = Liquid bulk temperature (R)
TLA = Average liquid temperature (R)
TLN = Daily min. liquid surface temperature (R)
TLX = Daily max. liquid surface temperature (R)
VLX = Tank max liquid volume (ft3)
VV = Vapor space volume (ft3)
WV = Vapor density

Tank emissions (tons/year)			
Tank	LS	LW	LT
901	1.3E-02	3.1E-02	4.4E-02
0	1.3E-02	8.2E-02	9.5E-02
903	1.3E-02	3.1E-02	4.4E-02
0	1.3E-02	6.2E-02	7.5E-02
905	1.3E-02	1.0E-01	1.1E-01
906	1.3E-02	3.1E-02	4.4E-02
0	1.3E-02	8.2E-02	9.5E-02
908	1.3E-02	9.8E-02	1.1E-01
917	2.8E-02	0.22	0.25
930	4.2E-03	1.9E-02	2.3E-02
S-5300	6.3E-04	3.5E-03	4.1E-03
1-3000	0.0E+00	2.4E-03	2.4E-03
1-5000	0.0E+00	3.3E-03	3.3E-03
	TOTAL		0.90

LT = LS + LW
For UST's, LS = 0
For AST's, LS = (days/year in service)(VV)(WV)(KE)(KS)
For vertical tanks, VV = (PI/4)(D^2)(HVO)
For horizontal tanks, VV = (PI/4)(DE^2)(HVO)
DE = SQRT(((L)(D))/0.785)
For vertical tanks, HVO = HS - HL + HRO
HL = HS/2
For flat roofs, HRO = 0
For dome roofs, HRO = 0.137(RS)
RS = D/2
For cone roofs, HRO = (1/3)(HR)
HR = (SR)(RS)
For horizontal tanks, HVO = 0.5(D)
WV = ((MV)(PVA))/((R)(TLA))
PVA = (10^(A - (B/(C + ((TLA - 492)5/9)))))(14.7/760)
TLA = 0.44(TAA) + 0.56(TB) + 0.0079(alpha)(I)
TB = TAA + 6(alpha) - 1
KE = (deltaTV/TLA) + ((deltaPV - deltaPB)/(PA - PVA))
deltaTV = 0.72(deltaTA) + 0.028(alpha)(I)
deltaPV = PVX - PVN
PVX = (10^(A - (B/(C + ((TLX - 492)5/9)))))(14.7/760)
TLX = TLA + 0.25(delta TV)
PVN = (10^(A - (B/(C + ((TLN - 492)5/9)))))(14.7/760)
TLN = TLA - 0.25(delta TV)
deltaPB = PBP - PBV
KS = 1/(1 + 0.053(PVA)(HVO))
LW = 0.0010(MV)(PVA)(Q)(KN)(KP)
For turnovers >36, KN = (180 + N)/(6(N))
N = (5.614(Q))/VLX
VLX = ((Tank Volume, bbls)(42))/7.48
For turnovers <36, KN = 1

Site Data	
Average ambient temperature (F) = TAA	46.9
Average high temperature (F) = TAX	59.3
Average low temperature (F) = TAN	33.1
Ambient temperature range (F) = delta TA	25.9
Average wind speed (mph) = v	10.2
Site elevation (ft) = SE	4,400
Average atmospheric pressure (psia) = PA	12.5
Solar insolation factor = I	1,529
Ideal gas constant = R	10.731
Reid vapor pressure, gasoline	10
Reid vapor pressure, crude oil	N/A

ASSUMPTIONS AND OTHER INFO:
1) Transmix is a mixture of all fuels and is assumed to have characteristics of gasoline.
2) MV's for other than fuels is based on product knowledge.
3) Vapor molecular weight (MV) is for fuel temps at 60 F. Lower temps will produce lower MV.
4) Stove Oil and Low Sulfur Diesel # 1 have similar constituents.

Note: Throughputs are based on allowable throughputs shown in Tier II Permit Application, dated April 2, 2001, plus throughput increase expected as a result of adding DRA to system, which is expected to increase gasoline by 166,000 gallons and diesel by 32,000 gallons.

NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
POTENTIAL FIXED ROOF TANK VOC EMISSIONS
UPDATED October 18, 2001

Tank	Tank characteristics: AST or UST	Horizontal or Vertical	Tank Color: Aluminum, beige, gray, red, or white	Paint Shade: Diffuse, light, N/A, medium, primer, or specular	Paint Condition: good or poor	Roof Type: Cone, dome, flat, or N/A	Tank volume (bbls)	Contents	A	alpha	B	C	D	DE	deltaPB	deltaPV	deltaTV	HL	HR	HRO	HS
A100	AST	Vertical	White	N/A	Good	Cone	500	Additive	2.351	0.17	163.21	82.4	15.0	N/A	0.06	0.0120	25.9	8.0	0.47	0.16	16.0
A101	AST	Horizontal	White	N/A	Good	N/A	143	Additive	2.351	0.17	163.21	82.4	8.0	12.8	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A102	AST	Horizontal	White	N/A	Good	N/A	95	Additive	2.351	0.17	163.21	82.4	6.0	12.1	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A103	AST	Horizontal	White	N/A	Good	N/A	98	Additive	2.351	0.17	163.21	82.4	8.0	10.6	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A104	AST	Horizontal	White	N/A	Good	N/A	98	Additive	2.351	0.17	163.21	82.4	8.0	10.6	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A105	AST	Horizontal	White	N/A	Good	N/A	48	Additive	2.351	0.17	163.21	82.4	5.3	9.0	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A106	AST	Horizontal	White	N/A	Good	N/A	48	Additive	2.351	0.17	163.21	82.4	5.3	9.0	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A107	AST	Horizontal	White	N/A	Good	N/A	24	Additive	2.351	0.17	163.21	82.4	4.0	7.5	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A108	AST	Horizontal	White	N/A	Good	N/A	215	Additive	2.351	0.17	163.21	82.4	8.0	15.6	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A109	AST	Horizontal	Aluminum	specular	Good	N/A	95	Additive	2.351	0.39	163.21	82.4	7.5	10.7	0.06	0.0178	35.3	N/A	N/A	N/A	N/A
A110	AST	Horizontal	White	N/A	Good	N/A	95	Additive	2.351	0.17	163.21	82.4	7.0	11.2	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
A111	AST	Horizontal	White	N/A	Good	N/A	60	Additive	2.351	0.17	163.21	82.4	3.6	5.4	0.06	0.0120	25.9	N/A	N/A	N/A	N/A
DRA	AST	Horizontal	White	N/A	Good	N/A	37	DRA	2.842	0.17	358.22	99.9	5.0	8.2	0.06	0.0022	25.9	N/A	N/A	N/A	N/A

Tank	HVO	KE	KN	KP	KS	L	MV	N	PBP	PBV	PVA	PVN	PVX	Q	RS	SR	TB	TLA	TLN	TLX	VLX	VV	WV
A100	8.2	0.05	1.00	1.0	0.99	N/A	110.0	4.0	0.03	-0.03	0.0227	0.0171	0.0291	2,000	7.5	0.0625	506.4	508.4	501.9	514.9	2,807	1,441	0.0005
A101	4.0	0.05	1.00	1.0	1.00	16.0	110.0	14.0	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	803	512	0.0005
A102	3.0	0.05	1.00	1.0	1.00	19.0	110.0	21.0	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	533	342	0.0005
A103	4.0	0.05	1.00	1.0	1.00	11.0	110.0	20.4	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	550	352	0.0005
A104	4.0	0.05	1.00	1.0	1.00	11.0	110.0	20.4	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	550	352	0.0005
A105	2.7	0.05	0.89	1.0	1.00	12.0	110.0	41.7	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	270	169	0.0005
A106	2.7	0.05	0.89	1.0	1.00	12.0	110.0	41.7	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	270	169	0.0005
A107	2.0	0.05	0.53	1.0	1.00	11.0	110.0	83.3	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	135	88	0.0005
A108	4.0	0.05	1.00	1.0	1.00	24.0	110.0	18.6	0.03	-0.03	0.0227	0.0171	0.0291	4,000	N/A	N/A	506.4	508.4	501.9	514.9	1,207	768	0.0005
A109	3.8	0.07	1.00	1.0	0.99	12.0	110.0	21.0	0.03	-0.03	0.0259	0.0180	0.0357	2,000	N/A	N/A	507.7	511.8	503.0	520.8	533	338	0.0005
A110	3.5	0.05	1.00	1.0	1.00	14.0	110.0	21.0	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	533	343	0.0005
A111	1.9	0.05	1.00	1.0	1.00	6.0	110.0	33.3	0.03	-0.03	0.0227	0.0171	0.0291	2,000	N/A	N/A	506.4	508.4	501.9	514.9	337	42	0.0005
A111	2.5	0.05	1.00	1.0	1.00	10.6	130.0	1.0	0.03	-0.03	0.0044	0.0034	0.0056	37	N/A	N/A	506.4	508.4	501.9	514.9	207	132	0.0001

A = Constant in vapor pressure equation
alpha = Tank paint solar absorptance
B = Constant in the vapor pressure equation
C = Constant in the vapor pressure equation
D = Tank diameter (ft)
DE = Effective tank diameter (ft)
deltaPB = Breather vent pressure range
deltaPV = Daily vapor pressure range
deltaTV = Daily vapor temp. range, (R)
HL = Liquid height (ft)
HR = Tank roof height (ft)
HRO = Roof outage (ft)
HS = Tank shell height (ft)
HVO = Vapor space outage (ft)
KE = Vapor space expansion factor
KN = Turnover factor
KP = Working loss product factor
KS = Vented vapor saturation factor
L = Length of tank (ft)
LS = Standing storage losses

LT = Total losses
LW = Working losses
MV = Vapor molecular weight
N = Number of turnovers
PBP = Breather vent pressure setting
PBV = Breather vent vacuum setting
PVA = Vapor pressure at average liquid temperature
PVN = Vapor pressure at min. surface temperature
PVX = Vapor pressure at max. surface temperature
Q = Annual throughput (bbl/yr)
RS = Tank shell radius (ft)
SR = Tank cone roof slope
TB = Liquid bulk temperature (R)
TLA = Average liquid temperature (R)
TLN = Daily min. liquid surface temperature (R)
TLX = Daily max. liquid surface temperature (R)
VLX = Tank max liquid volume (ft3)
VV = Vapor space volume (ft3)
WV = Vapor density

ASSUMPTIONS AND OTHER INFO:
1) Transmix is a mixture of all fuels and is assumed to have characteristics of gasoline.
2) MV's for other than fuels is based on product knowledge.
3) Vapor molecular weight (MV) is for fuel temps at 60 F. Lower temps will produce lower MV.

Tank emissions (tons/year)			
Tank	LS	LW	LT
A100	5.6E-03	2.5E-03	8.1E-03
A101	2.0E-03	2.5E-03	4.5E-03
A102	1.3E-03	2.5E-03	3.8E-03
A103	1.4E-03	2.5E-03	3.9E-03
A104	1.4E-03	2.5E-03	3.9E-03
A105	6.6E-04	2.2E-03	2.9E-03
A106	6.6E-04	2.2E-03	2.9E-03
A107	3.5E-04	1.3E-03	1.7E-03
A108	3.0E-03	5.0E-03	8.0E-03
A109	9.5E-04	2.9E-03	3.8E-03
A110	1.3E-03	2.5E-03	3.8E-03
A111	1.7E-04	2.5E-03	2.7E-03
DRA	1.2E-04	1.1E-05	1.3E-04
	TOTAL		5.0E-02

Site Data	
Average ambient temperature (F) = TAA	46.4
Average high temperature (F) = TAX	59.3
Average low temperature (F) = TAN	33.4
Ambient temperature range (F) = delta TA	25.9
Average wind speed (mph) = v	10.2
Site elevation (ft) = SE	4,400
Average atmospheric pressure (psia) = PA	12.5
Solar insolation factor = I	1,529
Ideal gas constant = R	10.731
Reid vapor pressure, gasoline	10
Reid vapor pressure, crude oil	N/A

LT = LS + LW
For UST's, LS = 0
For AST's, LS = (days/year in service)(VV)(WV)(KE)(KS)
For vertical tanks, VV = (PI/4)(D^2)(HVO)
For horizontal tanks, VV = (PI/4)(DE^2)(HVO)
DE = SQRT(((L)(D))/0.785)
For vertical tanks, HVO = HS - HL + HRO
HL = HS/2
For flat roofs, HRO = 0
For dome roofs, HRO = 0.137(RS)
RS = D/2
For cone roofs, HRO = (1/3)(HR)
HR = (SR)(RS)
For horizontal tanks, HVO = 0.5(D)
WV = ((MV)(PVA))/((R)(TLA))
PVA = (10^(A - (B/(C + ((TLA - 492)5/9)))))(14.7/760)
TLA = 0.44(TAA) + 0.56(TB) + 0.0079(alpha)(I)
TB = TAA + 6(alpha) - 1
KE = (deltaTV/TLA) + ((deltaPV - deltaPB)/(PA - PVA))
deltaTV = 0.72(deltaTA) + 0.028(alpha)(I)
deltaPV = PVX - PVN
PVX = (10^(A - (B/(C + ((TLX - 492)5/9)))))(14.7/760)
TLX = TLA + 0.25(delta TV)
PVN = (10^(A - (B/(C + ((TLN - 492)5/9)))))(14.7/760)
TLN = TLA - 0.25(delta TV)
deltaPB = PBP - PBV
KS = 1/(1 + 0.053(PVA)(HVO))
LW = 0.0010(MV)(PVA)(Q)(KN)(KP)
For turnovers >36, KN = (180 + N)/(6(N))
N = (5.614(Q))/VLX
VLX = ((Tank Volume, bbls)(42))/7.48
For turnovers <36, KN = 1

Note: Throughputs are based on allowable throughputs shown in Tier II Permit Application, dated April 2, 2001. DRA maximum throughput is not expected to exceed capacity of tank.

NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
POTENTIAL FLOATING ROOF TANK VOC EMISSIONS
UPDATED October 16, 2001

Tank	Tank shell: Construction (Welded or riveted)	Tank shell: Condition (Light rust, dense rust, or gunite lining)	Tank shell: Color (Aluminum, beige, black, gray or white)	Floating deck: Type (Internal, pontoon, or double deck)	Floating deck: Construction (Welded or bolted)	Seal types: Primary (Mechanical shoe, liquid mounted, or vapor mounted)	Seal types: Secondary (Shoe mounted, rim mounted, or weather shield)	Contents	A	B	C	CF	D	FC	FF	KC	KD
902	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Supreme	6.805	1263.50	273.1	0.0015	42.5	1.0	288	1.0	0.00
904	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Supreme	6.805	1263.50	273.1	0.0015	42.5	1.0	288	1.0	0.00
907	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	HS Diesel #2	2.642	358.22	99.9	0.0015	42.5	1.0	288	1.0	0.00
909	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Mid-Grade	6.805	1263.50	273.1	0.0015	40.0	1.0	283	1.0	0.00
910	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Mid-Grade	6.805	1263.50	273.1	0.0015	40.0	1.0	283	1.0	0.00
911	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Unleaded	6.805	1263.50	273.1	0.0015	56.5	1.0	317	1.0	0.00
912	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Supreme	6.805	1263.50	273.1	0.0015	40.0	1.0	283	1.0	0.00
913	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Unleaded	6.805	1263.50	273.1	0.0015	40.0	1.0	283	1.0	0.00
914	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Supreme	6.805	1263.50	273.1	0.0015	48.0	1.0	299	1.0	0.00
915	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Unleaded	6.805	1263.50	273.1	0.0015	40.0	1.0	283	1.0	0.00
916	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Unleaded	6.805	1263.50	273.1	0.0015	52.5	1.0	308	1.0	0.00
918	Welded	Light rust	White	Internal	Welded	Vapor mounted	N/A	Unleaded	6.805	1263.50	273.1	0.0015	56.5	1.0	317	1.0	0.00
919	Welded	Light rust	White	Internal	Bolted	Vapor mounted	Rim mounted	LS Diesel #2	2.642	358.22	99.9	0.0015	60.0	1.0	360	1.0	0.34
920	Welded	Light rust	White	Internal	Bolted	Vapor mounted	Rim mounted	Unleaded	6.805	1263.50	273.1	0.0015	60.0	1.0	360	1.0	0.34

Tank	KRa	KRb	MV	n	NC	P	PVA	Q	SD	TS	TSI	v	WL
902	6.7	N/A	66.0	N/A	1	0.0942	3.9455	244,242	0.20	506.4	0.0	0.0	6.2
904	6.7	N/A	66.0	N/A	1	0.0942	3.9455	243,894	0.20	506.4	0.0	0.0	6.2
907	6.7	N/A	130.0	N/A	1	0.0001	0.0040	385,790	0.20	506.4	0.0	0.0	7.0
909	6.7	N/A	66.0	N/A	1	0.0942	3.9455	346,565	0.20	506.4	0.0	0.0	6.2
910	6.7	N/A	66.0	N/A	1	0.0942	3.9455	347,224	0.20	506.4	0.0	0.0	6.2
911	6.7	N/A	66.0	N/A	1	0.0942	3.9455	1,574,367	0.20	506.4	0.0	0.0	6.2
912	6.7	N/A	66.0	N/A	1	0.0942	3.9455	270,694	0.20	506.4	0.0	0.0	6.2
913	6.7	N/A	66.0	N/A	1	0.0942	3.9455	744,107	0.20	506.4	0.0	0.0	6.2
914	6.7	N/A	66.0	N/A	1	0.0942	3.9455	404,128	0.20	506.4	0.0	0.0	6.2
915	6.7	N/A	66.0	N/A	1	0.0942	3.9455	744,078	0.20	506.4	0.0	0.0	6.2
916	6.7	N/A	66.0	N/A	1	0.0942	3.9455	1,339,310	0.20	506.4	0.0	0.0	6.2
918	6.7	N/A	66.0	N/A	1	0.0942	3.9455	1,574,837	0.20	506.4	0.0	0.0	6.2
919	2.2	N/A	130.0	N/A	1	0.0001	0.0040	964,963	0.20	506.4	0.0	0.0	7.0
920	2.2	N/A	66.0	N/A	1	0.0942	3.9455	1,034,388	0.20	506.4	0.0	0.0	6.2

Tank emissions (tons per year)

Tank	LD	LF	LR	LWD	LT
902	0.0E+00	0.90	0.89	2.8E-02	1.81
904	0.0E+00	0.90	0.89	2.8E-02	1.81
907	0.0E+00	1.5E-03	1.5E-03	4.6E-02	4.9E-02
909	0.0E+00	0.88	0.83	3.9E-02	1.75
910	0.0E+00	0.88	0.83	3.9E-02	1.75
911	0.0E+00	0.99	1.18	1.2E-01	2.29
912	0.0E+00	0.88	0.83	3.0E-02	1.74
913	0.0E+00	0.88	0.83	8.4E-02	1.80
914	0.0E+00	0.93	1.00	3.8E-02	1.97
915	0.0E+00	0.88	0.83	8.4E-02	1.80
916	0.0E+00	0.96	1.09	1.1E-01	2.17
918	0.0E+00	0.99	1.18	1.2E-01	2.29
919	1.3E-03	1.9E-03	6.8E-04	8.1E-02	8.5E-02
920	0.76	1.12	0.41	7.7E-02	2.37
			TOTAL		23.7

Site Data		
Average ambient temperature (F) = TAA	46.4	TAA = (TAX + TAN)/2
Ave. high temperature (F) = TAX	59.3	
Ave. low temperature (F) = TAN	33.4	
Ambient temperature range (F) = delta TA	25.9	delta TA = TAX - TAN
Average wind speed (mph) = v	10.2	
Site elevation (ft) = SE	4,400	
Average atmospheric pressure (psia) = PA	12.6	PA = (14.7/29.92)[illegible]
Solar insolation factor = I	1,529	
Ideal gas constant = R	10.731	
Reid vapor pressure, gasoline	10	
Reid vapor pressure, crude oil	N/A	

LT = LR + LWD + LF + LD

LR = (KRa + ((KRb)(v^n)))(P)(D)(MV)(KC)

For internal floating roofs, v = 0

P = (PVA/PA)/(1 + (1 - (PVA/PA))^0.5)^2

PVA = (10^(A - (B/(C + ((TS - 492)5/9)))))(14.7/760)

TS = TAA + TSI

LWD = (((0.943)(Q)(CF)(WL))/D)(1 + (((NC)(FC))/D))

LF = (FF)(P)(MV)(KC)

LD = (KD)(SD)(D^2)(P)(MV)(KC)

A = Constant in vapor pressure equation
B = Constant in vapor pressure equation
C = Constant in vapor pressure equation
CF = Shell clingage factor, bbl/1,000 ft2
D = Tank diameter, ft
FC = Effective column diameter, ft
FF = Total deck fitting loss factor, lb-mole/yr
KC = Product factor
KD = Deck seam loss
KRa = Zero wind speed rim seal loss factor
KRb = Wind dependent rim seal loss factor
LD = Deck seam loss
LF = Deck fitting loss
LR = Rim seal loss
LT = Total loss
LWD = Withdrawal loss
MV = Ave. vapor molecular weight, lb/lb-mole
n = Seal-related wind speed exponent
NC = Number of fixed roof column supports
P = Vapor pressure function
PVA = Vapor pressure at storage temp, psia
Q = Annual throughput, bbl/yr
SD = Deck seam lenght factor, ft/ft2
TS = Average annual stock temperature, R
TSI = Increase in stock temp. due to tank color
v = Average wind speed at tank site, mph
WL = Average organic liquid density, lb/gal

ASSUMPTIONS AND OTHER INFO:

1) Gasoline RVP assumed to average 10.0. Data suggests the true average to be 9.6.
2) Vapor molecular weight (MV) is for fuel temps at 60 F. Lower temps produce lower MV's.
3) Average atmospheric pressure based on site elevation.
4) Transmix is a mixture of all fuels and is assumed to have characteristics of gasoline.

Note; Throughputs are based on allowable throughputs shown in Tier II Permit Application, dated April 2, 2001, plus throughput increase expected as a result of adding DRA to system, which is expected to increase gasoline by 186,000 gallons and diesel by 32,000 gallons.

Deck fittings and loss factors

FF = Total deck fitting loss factor, lb-mole/yr
KF?? = loss factors for a particular type of deck fitting
KFa = zero wind speed loss factor for a fitting type
KFb = wind speed dependent loss factor for a fitting type
Kv = fitting wind speed correction factor
m = loss factor for a fitting type
NF?? = number of deck fittings of a particular type

FF = (NFah)(KFah) + (NFcw)(KFcw) + ... + (NFfw)(KFfw)
For external floaters, KF?? = KFa + (KFb)(((Kv)(v))^m)
Kv = 0.7
For internal floaters, KF?? = KFa

Tank	FF
902	288.0573
904	288.0573
907	288.0573
909	283.3667
910	283.3667
911	317.3663
912	283.3667
913	283.3667
914	298.956
915	283.3667
916	308.4656
918	317.3663
919	360.06
920	360.06

Access hatch						
Bolted or unbolted	Gasketed or ungasketed	KFah	KFa	KFb	m	NFah
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	35	N/A	N/A	1
Unbolted	Ungasketed	36	35	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1
Unbolted	Ungasketed	36	36	N/A	N/A	1

Fixed roof support column wells				
Round pipe or built-up column	Gasketed sliding cover, ungasketed sliding cover, or flexible fabric sleeve seal	KFcw	KFa	NFcw
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1
Built-up column	Ungasketed sliding cover	47	47	1

	Guidepoles and sample wells							
Tank	Unslotted or slotted	Sliding cover Gasketed, or ungasketed	w/ Pole sleeve, pole wiper, float, float/wiper, or float/wiper/sleeve	KFgp	KFa	KFb	m	NFgp
902	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
904	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
907	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
909	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
910	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
911	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
912	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
913	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
914	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
915	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
916	N/A	Gasketed	N/A	N/A	N/A	N/A	N/A	1
918	N/A	Gasketed	Float/wiper/sleeve	N/A	N/A	N/A	N/A	1
919	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
920	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1

Gauge-float well						
Bolted or unbolted	Gasketed or ungasketed	KFgf	KFa	KFb	m	NFgf
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1
Unbolted	Ungasketed	14	14	N/A	N/A	1

	Gauge-hatch/sample port					
Tank	Gasketed, ungasketed, or slit fabric seal	KFgh	KFa	KFb	m	NFgh
902	Slit fabric seal	12	12	N/A	N/A	1
904	Slit fabric seal	12	12	N/A	N/A	1
907	Slit fabric seal	12	12	N/A	N/A	1
909	Slit fabric seal	12	12	N/A	N/A	1
910	Slit fabric seal	12	12	N/A	N/A	1
911	Slit fabric seal	12	12	N/A	N/A	1
912	Slit fabric seal	12	12	N/A	N/A	1
913	Slit fabric seal	12	12	N/A	N/A	1
914	Slit fabric seal	12	12	N/A	N/A	1
915	Slit fabric seal	12	12	N/A	N/A	1
916	Slit fabric seal	12	12	N/A	N/A	1
918	Slit fabric seal	12	12	N/A	N/A	1
919	Slit fabric seal	12	12	N/A	N/A	1
920	Slit fabric seal	12	12	N/A	N/A	1

Deck drains					
Deck drains; open, Deck drains; closed, or stub drains	KFdd	KFa	KFb	m	NFdd
N/A	N/A	N/A	N/A	N/A	14
N/A	N/A	N/A	N/A	N/A	14
N/A	N/A	N/A	N/A	N/A	14
N/A	N/A	N/A	N/A	N/A	13
N/A	N/A	N/A	N/A	N/A	13
N/A	N/A	N/A	N/A	N/A	26
N/A	N/A	N/A	N/A	N/A	13
N/A	N/A	N/A	N/A	N/A	13
N/A	N/A	N/A	N/A	N/A	18
N/A	N/A	N/A	N/A	N/A	13
N/A	N/A	N/A	N/A	N/A	22
N/A	N/A	N/A	N/A	N/A	26
Stub drains	1.2	1.2	N/A	N/A	29
Stub drains	1.2	1.2	N/A	N/A	29

	Deck legs																	
							External pontoon deck											
							Pontoon area						Center area					
	Adjustable	Internal deck or external double deck					Gasketed, ungasketed,						Gasketed, ungasketed,					
Tank	or fixed	KFdl	KFa	KFb	m	NFdl	or sock	KFdl	KFa	KFb	m	NFdl	or sock	KFdl	KFa	KFb	m	NFdl
902	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
904	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
907	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
909	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
910	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
911	Adjustable	7.9	7.9	N/A	N/A	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
912	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
913	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
914	Adjustable	7.9	7.9	N/A	N/A	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
915	Adjustable	7.9	7.9	N/A	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
916	Adjustable	7.9	7.9	N/A	N/A	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
918	Adjustable	7.9	7.9	N/A	N/A	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
919	Adjustable	7.9	7.9	N/A	N/A	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
920	Adjustable	7.9	7.9	N/A	N/A	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Vacuum breakers						Rim vent						Ladder well			
Tank	Gasketed or ungasketed	KFvb	KFa	KFb	m	NFvb	Gasketed or ungasketed	KFrv	KFa	KFb	m	NFrv	Gasketed or ungasketed	KFlw	KFa	NFlw
902	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
904	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
907	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
909	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
910	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
911	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
912	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
913	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
914	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
915	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
916	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
918	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
919	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1
920	Gasketed	6.2	6.2	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	1	Ungasketed	76	76	1

NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
POTENTIAL FUGITIVE VOC EMISSIONS
UPDATED October 16, 2001

Source	Service	Number Of Units	Emission Factor*	Emissions (Tons/Yr)
Valves	Liquid	1,089	9.48E-05	0.45
Valves	Vapor	30	2.87E-05	3.8E-03
Fittings	Liquid	902	1.76E-05	7.0E-02
Fittings	Vapor	100	9.26E-05	4.1E-02
Pump Seals		41	1.19E-03	0.21
Others	Liquid	87	2.87E-04	0.11
		TOTAL		**0.89**

*Table 2-3 Marketing Terminal Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995
Emissions = (# of units)(emission factor)(hours/day)(365)/2000

Emissions = (# of units)(emission factor)(hours/day)(365)/2000

Number of valves is actual times 1.1
Number of fittings is actual times 1.1
Number of pump seals is actual
Number of others is actual times 1.1

Actual counts increased to accomodate possible overlooked sources.

Truck loading fugitive emissions accounted for in the valves and fittings listed as in vapor service.

APPENDIX C

Toxic Air Pollutant Emission Estimates

NORTHWEST TERMINALLING COMPANY
POCATELLO TERMINAL
POTENTIAL EMISSIONS SUMMARY AND HAP DATA
UPDATED October 16, 2001

ASSUMPTIONS AND OTHER INFO:
1) Maintenance assumed to add an additional 2% to the total facility emissions.
2) HAP concentrations as specified in HAP legend.
3) Vapor destruction unit (VDU) natural gas burn VOC's are accounted for in the truck loading section, while HAP's are not. Current usage averages 43 SCF per hour.

(TONS PER YEAR)	Potential VOCs	Potential HAPs (LTI) 75-07-0	107-02-8	50-00-0	71-43-2	92-52-4	1319-77-3	98-82-8	100-41-4	110-54-3	1634-04-4	91-20-3	108-95-2	100-42-5	108-88-3	1330-20-7	Total HAPs
Fugitive sources:																	
Valves - liquid	0.45				5.9E-03		1.4E-03	4.5E-04	5.2E-03	5.7E-03		1.2E-03	2.4E-03	1.9E-04	2.4E-02	2.9E-02	7.6E-02
Valves - vapor	3.8E-03				8.9E-04		2.3E-07	2.7E-06	6.8E-05	1.5E-03		3.3E-07	6.7E-07	1.6E-06	1.0E-03	3.5E-04	3.8E-03
Fittings - liquid	7.0E-02				9.1E-04		2.1E-04	7.0E-05	8.0E-04	8.9E-04		1.9E-04	3.7E-04	2.9E-05	3.8E-03	4.5E-03	1.2E-02
Fittings - vapor	4.1E-02				9.6E-03		2.5E-06	2.9E-05	7.3E-04	1.6E-02		3.5E-06	7.2E-06	1.7E-05	1.1E-02	3.7E-03	4.1E-02
Pump Seals	0.21				2.8E-03		8.4E-04	2.1E-04	2.4E-03	2.7E-03		5.7E-04	1.1E-03	8.8E-05	1.1E-02	1.4E-02	3.6E-02
Others - liquid	0.11				1.4E-03		3.3E-04	1.1E-04	1.3E-03	1.4E-03		2.9E-04	5.8E-04	4.5E-05	5.9E-03	7.0E-03	1.8E-02
TOTAL	0.89	0.0E+00	0.0E+00	0.0E+00	2.1E-02	0.0E+00	2.5E-03	9.7E-04	1.0E-02	2.8E-02	0.0E+00	2.3E-03	4.5E-03	3.7E-04	5.7E-02	5.8E-02	0.19
Fixed roof tanks																	
901 LS Diesel #1	4.4E-02				1.5E-03	3.3E-06	9.8E-06	1.9E-04	4.5E-04	4.4E-03	8.0E-03	4.8E-05	1.7E-05	2.6E-05	1.3E-02	6.4E-03	3.4E-02
0 LS Diesel #2	9.5E-02				3.2E-03	7.2E-06	2.1E-05	4.1E-04	9.8E-04	9.6E-03	1.7E-02	1.0E-04	3.6E-05	5.5E-05	2.8E-02	1.4E-02	7.4E-02
903 LS Diesel #1	4.4E-02				1.5E-03	3.3E-06	9.8E-06	1.9E-04	4.5E-04	4.4E-03	8.1E-03	4.8E-05	1.7E-05	2.8E-05	1.3E-02	6.4E-03	3.4E-02
0 HS Diesel #2	7.5E-02				2.6E-03	5.7E-06	1.6E-05	3.2E-04	7.7E-04	7.6E-03	1.4E-02	8.2E-05	2.9E-05	4.4E-05	2.2E-02	1.1E-02	5.9E-02
905 HS Diesel #2	1.1E-01				3.8E-03	8.6E-06	2.4E-05	4.8E-04	1.2E-03	1.1E-02	2.1E-02	1.2E-04	4.3E-05	6.5E-05	3.4E-02	1.6E-02	8.8E-02
906 LS Diesel #1	4.4E-02				1.5E-03	3.3E-06	9.8E-06	1.9E-04	4.5E-04	4.4E-03	8.1E-03	4.8E-05	1.7E-05	2.6E-05	1.3E-02	6.4E-03	3.4E-02
0 LS Diesel #2	9.5E-02				3.2E-03	7.2E-06	2.1E-05	4.1E-04	9.8E-04	9.8E-03	1.7E-02	1.0E-04	3.6E-05	5.5E-05	2.8E-02	1.4E-02	7.4E-02
908 HS Diesel #2	1.1E-01				3.8E-03	8.5E-06	2.4E-05	4.8E-04	1.1E-03	1.1E-02	2.0E-02	1.2E-04	4.3E-05	6.5E-05	3.3E-02	1.6E-02	8.7E-02
917 LS Diesel #2	0.25				8.5E-03	1.9E-05	5.4E-05	1.1E-03	2.6E-03	2.5E-02	4.6E-02	2.7E-04	9.6E-05	1.5E-04	7.5E-02	3.6E-02	0.19
930 Transmix	2.3E-02				5.5E-03		1.4E-06	1.7E-05	4.2E-04	9.0E-03		2.0E-06	4.1E-06	1.0E-05	8.2E-03	2.2E-03	2.3E-02
S-5300 Transmix	4.1E-03				9.7E-04		2.5E-07	2.9E-06	7.4E-05	1.6E-03		3.8E-07	7.3E-07	1.7E-06	1.1E-03	3.8E-04	4.1E-03
1-3000 Transmix	2.4E-03				5.7E-04		1.5E-07	1.7E-06	4.3E-05	9.3E-04		2.1E-07	4.3E-07	1.0E-06	6.5E-04	2.2E-04	2.4E-03
1-5000 Transmix	3.3E-03				7.9E-04		2.0E-07	2.4E-06	6.0E-05	1.3E-03		2.9E-07	5.9E-07	1.4E-06	8.9E-04	3.1E-04	3.3E-03
A100 OGA 493Q	8.1E-03							2.8E-04								1.4E-03	1.7E-03
A101 TFA 4904	4.5E-03								1.7E-05							1.6E-04	1.7E-04
A102 Starreon	3.8E-03											4.4E-06					4.4E-06
A103 Guardian	3.9E-03											1.5E-05				6.7E-04	6.8E-04
A104 OGA 591	3.0E-03							1.3E-04								6.7E-04	8.0E-04
A105 HiTec 4980	2.9E-03							9.8E-05	2.1E-05			2.2E-07				2.7E-04	3.9E-04
A106 Valve Master	2.9E-03																0.0E+00
A107 Paradyne 670	1.7E-03											6.3E-06					6.3E-06
A108 OGA 401W	8.0E-03							2.7E-04								1.4E-03	1.7E-03
A109 HiTec 4103	3.8E-03																0.0E+00
A110 Phase V	3.8E-03																0.0E+00
A111 Red Dye	2.7E-03								5.7E-04							2.1E-03	2.7E-03
DRA DRA	1.3E-04																0.0E+00
TOTAL	0.95	0.0E+00	0.0E+00	0.0E+00	3.8E-02	6.6E-05	1.9E-04	4.5E-03	1.0E-02	1.0E-01	1.8E-01	9.7E-04	3.4E-04	5.2E-04	0.27	1.4E-01	0.72
Floating roof tanks																	
902 Supreme	1.81				1.0E-02		1.2E-04	2.8E-05	1.3E-03	1.8E-02		1.1E-04	2.1E-04	3.5E-05	1.4E-02	5.9E-03	5.0E-02
904 Supreme	1.81				1.0E-02		1.2E-04	2.8E-05	1.3E-03	1.8E-02		1.1E-04	2.1E-04	3.5E-05	1.4E-02	5.9E-03	5.0E-02
907 HS Diesel #2	4.9E-02				1.1E-04	3.6E-05	4.9E-05	3.9E-05	6.0E-05	3.2E-04	5.7E-04	1.5E-04	5.3E-05	4.2E-06	1.2E-03	8.8E-04	3.4E-03
909 Mid-Grade	1.75				1.0E-02		1.8E-04	3.3E-05	1.5E-03	1.7E-02		1.6E-04	3.1E-04	4.2E-05	1.5E-02	6.9E-03	5.1E-02
910 Mid-Grade	1.75				1.0E-02		1.8E-04	3.3E-05	1.5E-03	1.7E-02		1.6E-04	3.1E-04	4.2E-05	1.5E-02	6.9E-03	5.1E-02
911 Unleaded	2.29				1.4E-02		5.6E-04	8.4E-05	3.2E-03	2.3E-02		5.0E-04	9.8E-04	1.0E-04	2.5E-02	1.5E-02	8.3E-02
912 Supreme	1.74				9.9E-03		1.4E-04	2.8E-05	1.3E-03	1.7E-02		1.2E-04	2.5E-04	3.7E-05	1.4E-02	6.2E-03	4.9E-02
913 Unleaded	1.80				1.1E-02		3.8E-04	5.8E-05	2.3E-03	1.8E-02		3.4E-04	6.6E-04	7.0E-05	1.8E-02	1.1E-02	6.2E-02
914 Supreme	1.87				1.1E-02		1.7E-04	3.4E-05	1.6E-03	1.9E-02		1.5E-04	3.0E-04	4.4E-05	1.6E-02	7.2E-03	5.6E-02
915 Unleaded	1.80				1.1E-02		3.8E-04	5.8E-05	2.3E-03	1.8E-02		3.4E-04	6.6E-04	7.0E-05	1.8E-02	1.1E-02	6.2E-02
916 Unleaded	2.17				1.3E-02		5.2E-04	7.7E-05	3.0E-03	2.2E-02		4.6E-04	9.0E-04	9.2E-05	2.3E-02	1.4E-02	7.8E-02
918 Unleaded	2.29				1.4E-02		5.6E-04	8.4E-05	3.2E-03	2.3E-02		5.0E-04	9.9E-04	1.0E-04	2.5E-02	1.5E-02	8.3E-02
919 LS Diesel #2	8.5E-02				1.5E-04	9.8E-05	8.6E-05	6.3E-05	9.1E-05	4.2E-04	7.4E-04	2.7E-04	9.2E-05	6.6E-06	1.6E-03	1.3E-03	5.0E-03
920 Unleaded	2.37				1.4E-02		3.5E-04	5.8E-05	2.4E-03	2.4E-02		3.1E-04	6.1E-04	7.2E-05	2.2E-02	1.1E-02	7.5E-02
TOTAL	23.7	0.0E+00	0.0E+00	0.0E+00	0.14	1.5E-04	3.8E-03	7.0E-04	2.5E-02	0.24	1.3E-03	3.7E-03	6.6E-03	7.5E-04	0.22	1.2E-01	0.78
Truck loading VDU Stack																	
Gasoline	15.47				8.5E-02		2.2E-05	1.0E-04	7.1E-03	1.5E-01		3.1E-05	6.3E-05	1.6E-04	1.0E-01	3.2E-02	3.8E-01
Transmix	3.9E-02				9.3E-03		2.4E-06	2.8E-05	7.1E-04	1.5E-02		3.4E-06	7.0E-06	1.7E-05	1.1E-02	3.6E-03	3.9E-02
Diesel	1.3E+00				4.5E-02	1.0E-04	2.9E-04	3.6E-03	1.4E-02	1.3E-01	2.4E-01	1.4E-03	5.1E-04	7.7E-04	3.9E-01	1.9E-01	1.0E+00
Natural Gas Usage	See note 3	8.3E-06	3.1E-06	9.7E-06	4.4E-06							4.2E-05			1.4E-06	8.2E-07	7.0E-05
TOTAL	16.8	8.3E-06	3.1E-06	9.7E-06	0.14	1.0E-04	3.1E-04	3.8E-03	0.02	0.30	2.4E-01	1.5E-03	5.7E-04	9.5E-04	0.51	0.23	1.45
Maintenance	0.8				0.20		5.2E-05	6.0E-04	0.02	0.33		7.3E-05	1.5E-04	3.8E-04	0.23	0.09	0.85
TOTAL FACILITY EMISSIONS	43.2	8.3E-06	3.1E-06	9.7E-06	0.54	3.2E-04	6.9E-03	1.2E-02	0.08	0.99	0.40	8.5E-03	1.2E-02	2.9E-03	1.29	0.62	3.96

				Weight fraction of component I in the liquid, lb i/lb (ZI,L)													
Stream Description	Acet-aldehyde 75-07-0	Acrolein 107-02-8	Form-aldehyde 50-00-0	Benzene 71-43-2	Biphenyl 92-52-4	Cresol 1319-77-3	Cumene 98-82-8	Ethyl-benzene 100-41-4	n-Hexane 110-54-3	MTBE 1634-04-4	Naph-thalene 91-20-3	Phenol 108-95-2	Styrene 100-42-5	Toluene 108-88-3	Xylenes 1330-20-7	Totals
Conventional Gasoline (all grades)				1.80E-02	0	4.52E-03	5.80E-04	1.80E-02	1.90E-02	0	3.99E-03	7.85E-03	6.22E-04	8.22E-02	8.68E-02	2.42E-01
Oxygenated Conventional Gasoline				1.80E-02	0	4.57E-03	5.80E-04	1.80E-02	1.90E-02	1.50E-01	3.99E-03	7.85E-03	6.22E-04	8.22E-02	8.68E-02	3.92E-01
Diesel No. 2, No. 1, Heating Fuel				1.77E-04	1.21E-03	1.05E-03	5.75E-04	6.30E-04	3.14E-04	3.35E-04	3.27E-03	1.12E-03	5.39E-05	5.74E-03	9.81E-03	2.41E-02
Crude Oil				3.03E-03	0	1.31E-03	1.02E-03	1.80E-03	9.37E-03	5.33E-03	7.45E-04	1.25E-04	9.84E-04	5.27E-03	7.84E-03	3.69E-02
Jet Fuel, Commercial Jet Fuel, JP-8				7.69E-03	4.44E-03	2.78E-03	1.13E-03	2.95E-03	1.72E-02	0	6.38E-03	3.14E-03	9.85E-04	2.04E-02	1.38E-02	8.10E-02
Transmix				1.30E-02	0	3.00E-03	1.00E-03	1.15E-02	1.27E-02	0	2.70E-03	5.30E-03	4.13E-04	5.40E-02	8.40E-02	1.88E-01
Natural Gas (ZI,V)	3.53E-02	1.31E-02	4.09E-02	1.85E-02							1.79E-01			5.90E-03	2.20E-03	2.94E-01
HAP weight fraction data comes from CRTC.			A	6.905	7.9624	6.911	6.963	6.975	6.876	6.85249	7.3729	7.133	7.14	6.954	7.04014	
Natural gas data comes from Radian Corp.			B	1211.033	2599.82	1435.5	1460.793	1424.255	1171.17	1103.737	1968.36	1516.79	1574.51	1344.8	2090.32	
Natural Gas emission factors are lbs. per million cf of gas burned.			C	220.79	256	165.16	207.78	213.21	224.41	222.72	222.61	174.95	224.09	219.48	273.16	
			Mi	78.11	154.21	108.14	120.19	106.17	86.18	88	128.17	94.11	104.15	92.14	106.17	

Conventional Gasoline (all grades)	ML	100	P	0.790	2.52E-04	8.05E-04	3.01E-02	6.64E-02	1.326	2.262	1.33E-03	1.34E-03	4.38E-02	0.213	6.18E-02
	MV	66	PI	1.82E-02	0.00E+00	3.38E-06	1.40E-05	1.12E-03	3.70E-02	0.00E+00	4.13E-06	1.12E-05	2.61E-05	1.90E-02	5.06E-03
	WL	6.2	xI	2.31E-02	0.00E+00	4.18E-03	4.66E-04	1.69E-02	2.79E-02	0.00E+00	3.11E-03	8.34E-03	5.97E-04	8.92E-02	8.18E-02
	PVA	3.9455	yI	4.62E-03	0.00E+00	8.52E-07	3.55E-06	2.84E-04	9.38E-03	0.00E+00	1.05E-06	2.83E-06	6.63E-06	4.81E-03	1.28E-03
	TLA	8.0	ZI,V	5.47E-03	0.00E+00	1.40E-06	6.47E-06	4.58E-04	9.89E-03	0.00E+00	2.03E-06	4.04E-06	1.05E-05	6.72E-03	2.06E-03
Oxygenated Conventional Gasoline	ML	100	P												
	MV	66	PI												
This material is not located at this facility.	WL	6.2	xI												
	PVA		yI												
	TLA		ZI,V												
Diesel No. 2, No. 1, Heating Fuel	ML	130	P	0.830	2.73E-04	8.93E-04	3.22E-02	7.07E-02	1.389	2.385	1.44E-03	1.46E-03	4.66E-02	0.225	6.54E-02
	MV	130	PI	2.45E-04	2.77E-07	1.13E-06	2.00E-05	5.45E-05	8.33E-04	1.17E-03	4.76E-06	2.20E-06	3.14E-06	1.82E-03	7.70E-04
	WL	7	xI	2.95E-04	1.02E-03	1.27E-03	6.21E-04	7.71E-04	6.00E-04	4.85E-04	3.31E-03	1.55E-03	6.73E-05	8.10E-03	1.18E-02
	PVA	0.0043	yI	5.68E-02	6.42E-05	2.62E-04	4.64E-03	1.26E-02	0.193	0.271	1.10E-03	5.29E-04	7.27E-04	0.422	0.178
	TLA	8.9	ZI,V	3.41E-02	7.82E-05	2.18E-04	4.29E-03	1.03E-02	0.101	0.183	1.09E-03	3.83E-04	5.83E-04	0.299	0.146
Crude Oil	ML	675	P												
	MV	50	PI												
This material is not located at this facility.	WL	7.7	xI												
	PVA		yI												
	TLA		ZI,V												
Jet Fuel, Commercial Jet Fuel, JP-8	ML	130	P												
	MV	130	PI												
This material is not located at this facility.	WL	8.7	xI												
	PVA		yI												
	PVA		yI												
	TLA		ZI,V												
Transmix	ML	100	P	0.860	2.89E-04	9.61E-04	3.38E-02	7.39E-02	1.437	2.442	1.52E-03	1.59E-03	4.88E-02	0.234	6.82E-02
	MV	66	PI	1.43E-02	0.00E+00	2.67E-06	2.81E-05	8.01E-04	2.68E-02	0.00E+00	3.21E-06	8.93E-06	1.94E-05	1.37E-02	4.11E-03
	WL	6	xI	1.66E-02	0.00E+00	2.77E-03	8.32E-04	1.06E-02	1.86E-02	0.00E+00	2.11E-03	5.63E-03	3.97E-04	5.85E-02	6.03E-02
	PVA	0.0193	yI	0.741	0.00E+00	1.38E-04	1.45E-03	4.14E-02	1.384	0.00E+00	1.66E-04	4.62E-04	1.00E-03	0.710	0.213
	TLA	9.6	ZI,V	0.876	0.00E+00	2.26E-04	2.85E-03	6.66E-02	1.430	0.00E+00	3.22E-04	6.56E-04	1.86E-03	0.991	0.342

A = constant in vapor pressure equation, dimensionless
B = constant in vapor pressure equation, degrees C
C = constant in vapor pressure equation, degrees C
LD = deck seam losses, lb/yr
LF = roof fitting losses, lb/yr
LR = rim seal losses, lb/yr
LT = total losses, lb/yr

LTI = emission rate of component I, lb/yr (fixed)
LTI = emission rate of component I, lb/yr (floating)
LWD = withdrawal losses, lb/yr
Mi = molecular weight of component I, lb/lb-mole
ML = molecular weight of liquid stock, lb/lb-mole
MV = molecular weight of vapor stock, lb/lb-mole
P = vapor pressure of component I at liquid surface temperature, psia

PI = partial pressure of component I, psia
PVA = total vapor pressure of liquid mixture, psia
TLA = average liquid surface temperature, degrees C
xI = liquid mole fraction of component I, lb-mole/lb-mole
yI = vapor mole fraction of component I, lb-mole/lb-mole
ZI,L = weight fraction of component I in the liquid, lb/lb
ZI,V = weight fraction of component I in the vapor, lb/lb

For fugitive sources - liquid, LTI = (ZI,L)(LT)
For floating roof tanks, LTI = (ZI,V)(LR + LF + LD) + (ZI,L)(LWD)
For all other sources, LTI = (ZI,V)(LT)
ZI,V = ((yI)(MI))/MV = (10^(A - (B/(TLA + C)))(0.0193368)(ZI,L)(ML)/PVA/MV)
yI = PI/PVA
PI = (P)(xI)
P = (10^(A - (B/(TLA + C)))(0.0193368)
xI = ((ZI,L)(ML))/MI

ADDITIVE DATA

Additive			HAP's	CAS #	ZI,L	A	B	C	Mi
OGA 493O	ML	130	Cumene	98-82-8	2.00E-02	6.963	1460.793	207.78	120.19
	MV	110	Xylene	1330-20-7	5.00E-02	7.94014	2090.32	273.16	106.17
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
TFA 4904	ML	130	Ethylbenzene	100-41-4	1.00E-03	6.975	1424.255	213.21	106.17
	MV	110	Xylene	1330-20-7	1.00E-02	7.94014	2090.32	273.16	106.17
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
Starreon	ML	130	Naphthalene	91-20-3	1.50E-02	7.3729	1968.36	222.61	128.17
	MV	110							
	WL	7.64							
	PVA	0.023							
	TLA	9.1							
Guardian	ML	130	Naphthalene	91-20-3	5.00E-02	7.3729	1968.36	222.61	128.17
	MV	110	Xylene	1330-20-7	5.00E-02	7.94014	2090.32	273.16	106.17
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
OGA 501	ML	130	Cumene	98-82-8	2.00E-02	6.963	1460.793	207.78	120.19
	MV	110	Xylene	1330-20-7	5.00E-02	7.94014	2090.32	273.16	106.17
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
HiTec 4980	ML	130	Cumene	98-82-8	2.00E-02	6.963	1460.793	207.78	120.19
	MV	110	Ethylbenzene	100-41-4	2.00E-03	6.975	1424.255	213.21	106.17
	WL	7.71	Naphthalene	91-20-3	1.00E-03	7.3729	1968.36	222.61	128.17
	PVA	0.023	Xylene	1330-20-7	2.70E-02	7.94014	2090.32	273.16	106.17
	TLA	9.1							
Valve Master	ML	130							
	MV	110							
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
Paradyne 670	ML	130	Naphthalene	91-20-3	5.00E-02	7.3729	1968.36	222.61	128.17
	MV	110							
	MV	110							
	WL	7.71							
	PVA	0.023							
	TLA	9.1							
OGA 401W	ML	130	Cumene	98-82-8	2.00E-02	6.963	1460.793	207.78	120.19
	MV	110	Xylene	1330-20-7	5.00E-02	7.94014	2090.32	273.16	106.17
	WL	7.37							
	PVA	0.023							
	TLA	9.1							
HiTec 4103	ML	130							
	MV	110							
	WL	7.43							
	PVA	0.026							
	TLA	11.0							
Phase V	ML	130							
	MV	110							
	WL	7.34							
	PVA	0.023							
	TLA	9.1							
Red B - 50	ML	130	Ethylbenzene	100-41-4	1.35E-01	6.975	1424.255	213.21	106.17
	MV	110	Xylenes	1330-20-7	5.40E-01	7.94014	2090.32	273.16	106.17
	WL	8.26							
	PVA	0.023							
	TLA	9.1							

Source for HAP data is product MSDS.

Where a concentration range is given in the MSDS, high end of range is listed.

	Cumene	Ethyl-benzene	Naph-thalene	Xylene
P	3.27E-02			6.63E-02
Pi	7.07E-04			4.06E-03
xi	2.16E-02			6.12E-02
yi	3.12E-02			0.179
Zi,V	3.41E-02			0.173
P		7.17E-02		6.63E-02
Pi		8.78E-05		8.12E-04
xi		1.22E-03		1.22E-02
yi		3.87E-03		3.56E-02
Zi,V		3.74E-03		3.46E-02
P			1.48E-03	
Pi			2.22E-05	
xi			1.52E-02	
yi			9.82E-04	
Zi,V			1.14E-03	
P			1.48E-03	6.63E-02
Pi			7.42E-05	4.06E-03
xi			5.07E-02	6.12E-02
yi			3.27E-03	0.179
Zi,V			3.82E-03	0.173
P	3.27E-02			6.63E-02
Pi	7.07E-04			4.06E-03
xi	2.16E-02			6.12E-02
yi	3.12E-02			0.179
Zi,V	3.41E-02			0.173
P	3.27E-02	7.17E-02	1.48E-03	6.63E-02
Pi	7.07E-04	1.76E-04	1.48E-06	2.19E-03
xi	2.16E-02	2.45E-03	1.01E-03	3.31E-02
yi	3.12E-02	7.75E-03	8.55E-05	9.67E-02
Zi,V	3.41E-02	7.48E-03	7.63E-05	9.34E-02
P				
Pi				
xi				
yi				
Zi,V				
P			1.48E-03	
Pi			7.42E-05	
Pi			2.43E-07	
xi			5.07E-02	
yi			3.27E-03	
Zi,V			3.82E-03	
P	3.27E-02			6.63E-02
Pi	7.07E-04			4.06E-03
xi	2.18E-02			6.12E-02
yi	3.12E-02			0.179
Zi,V	3.41E-02			0.173
P				
Pi				
xi				
yi				
Zi,V				
P				
Pi				
xi				
yi				
Zi,V				
P		7.17E-02		6.63E-02
Pi		1.18E-02		4.35E-02
xi		0.165		0.651
yi		0.523		1.635
Zi,V		0.505		1.667